West Virginia
Office of Technology

Strategic Plan:
2012-2015

Dear Colleagues,

I am pleased to present the 2012 strategic plan update for the West Virginia Office of Technology (OT), which outlines our approach to achieving the goals and objectives set to optimize information technology (IT) services for the State of West Virginia from 2012 to 2015. The primary objective of this strategic plan is to establish and maintain a clear alignment of the state's IT resources and its business needs.

The plan outlines our approach to the consolidation, standardization, centralization, and integration of the state's IT assets. Since the inception of this strategic direction nearly six years ago, the OT continues to make improvements in IT operations. Specifically, the OT created numerous efficiencies within the executive branch by reducing or eliminating many duplicative functions, leveraging the state's buying power to reduce per unit costs, and gaining economies of scale.

Through optimization efforts, the OT is positioned well to assist agencies in achieving their goals by providing more services with fewer resources and utilizing automation to enhance the efficiency and effectiveness of state programs. Over the past six years, IT related costs excluding labor have declined approximately 17%, while labor related costs have continued to decline as IT staffing levels across the executive branch declined by more than 14%. These cost savings did not come at the expense of quality of service, as the OT maintains high levels of reliability, security, and customer satisfaction.

The rest of the nation is taking notice of our success. In 2009, both the Center for Digital Government and the National Association of State Chief Information Officers (NASCIO) recognized West Virginia for our achievements in technology innovation, which marked the first time either of these prestigious organizations honored the state's efforts. Since that initial recognition, West Virginia has earned praise on six other occasions concerning e-government portal delivery, IT consolidation, and IT security management.

Building on this strong foundation of success, we have continued working together to optimize the state's technical assets. Over the past six years, the OT has primarily focused on modernizing the state's technical infrastructure and gaining efficiencies through consolidation and standardization. Today, the OT is now shifting its focus to the state's legacy applications development environment, the deployment of mobile technologies, and enhanced security.

This year, West Virginia began the initial stages of an Enterprise Resource Planning System (ERP) implementation. The ERP system will transform the state's business processes through automation more than any other IT initiative embarked upon in the past. This system will fully or partially replace approximately 100 of the state's existing legacy applications.

Even with a fully implemented ERP system, the state will still face significant support challenges with the remaining portfolio of legacy applications. Because many application and database environments are technologically obsolete, vendor support and security patches are no longer available. Application development, maintenance, and support within state government is highly distributed, resulting in limited coding and development standards, weak continuity of operation plans, and incomplete disaster recovery strategies.

The state spends over $35 million annually to support these highly distributed business applications. Approximately 500 of these legacy business applications, which utilize over 70 different application development languages and over 40 different data repository tools, exist within the executive branch. Simply put, the state cannot sustain this business model.

Despite funding challenges, the state's IT investments continue to increase primarily due to stimulus funding and other federal grants. These federal funds are giving the state opportunities to deploy technologies that once seemed unaffordable in the past, such as ubiquitous broadband and a disaster recovery center. As stimulus programs continue, we expect to see high levels of IT investment through 2012. While fortunate to receive this funding, the state will be challenged, as it is solely responsible for the on-going maintenance, support and sustainability of these newly deployed IT assets. Unless we act responsibly today to achieve even greater levels of efficiency, the State's annual IT expenses will likely increase by at least 20% through the planning period.

With that said, the OT will focus on many important areas in the upcoming planning cycle centered on (1) tightening partnerships and alignment with the business side of state government; (2) continually improving our operations; (3) strengthening the security of information entrusted to us; and (4) enhancing our enterprise applications development environment. Our future success as a state depends in many ways on our ability to progress in these focus areas.

The OT's strategic plan provides a roadmap for the planning of IT activities for 2012 through 2015. Each section of this document briefly discusses the background, history, recent accomplishments, and future plans for each of the OT's functional areas. With this plan, the OT is prepared to move forward to more efficiently deliver IT services that best enable the state to perform its business functions.

Thank you for your ongoing support in this process, and I look forward to our continued working relationship.

Yours truly,

Kyle Schafer
CTO and Director of Information Services and Communications
West Virginia Office of Technology

Table of Contents

1 Background

1.1 Mission

The Office of Technology (OT) will provide highly reliable, secure and cost effective oversight, leadership, administration, and direction for activities relating to information technology (IT) to all agencies across state government and enable state agencies to better service the citizens, businesses and other interested parties in West Virginia. The Office of Technology (OT) will enhance the state's technical infrastructure in order to attract business, improve access to information as well as enhance educational opportunities for our children and future generations.

1.2 Vision

The (OT) envisions that state employees have the technologies they need at their fingertips, in a prompt and timely fashion, that enables them to provide exceptional, top quality, reliable services to the taxpayers of West Virginia; and, through public/private partnerships, create a robust, highly reliable, technical infrastructure that will promote economic growth and outside investments.

1.3 Guiding Principles

The core of the OT's strategic planning process, operational philosophy, and management decisions center on the following foundational beliefs:

1. We value our customers and will always treat them with professionalism and respect.

2. We will pursue change and continuous improvement with a sense of urgency, and will continually look for opportunities to consolidate, centralize, and standardize technology when the outcome will provide better security, more reliability, and/or lower costs.

3. We will have a passion for our work and the success of our customers and clients.

4. We will meet our customer commitments as defined in our service level agreements and will measure our progress in order to achieve higher service levels in the future.

5. We will always pursue the highest quality solution at the lowest possible cost without regard for personal bias or self-preservation.

6. We will work as a team and respect our co-workers and peers.

7. We will not walk away from an issue when customers are without service until the issue is resolved or a mutually acceptable solution is achieved.

8. We are a trusted custodian of highly confidential and sensitive information and will protect the citizen and business information entrusted to us.

9. We will focus on solutions that meet the needs of the state, not necessarily those that satisfy the wants or desires of a specific agency.

10. We will enable the state to continue servicing the critical needs of citizens in times of disaster through the proper planning and deployment of technology.

1.4 Strategic Objectives

The OT continuously strives to maintain the following strategic goals:

1. Maintain the highest levels of customer satisfaction as defined in our SLAs.

2. Make government services more accessible.

3. Implement common infrastructure and business applications.

4. Ensure state information assets are secured and privacy protected.

5. Lower costs and improve the quality of the state technical infrastructure.

6. Strengthen our technology workforce.

1.5 Consolidation

After completing a detailed assessment of the state's technology infrastructure in November 2005, the OT recommended to the governor, his cabinet, and to the legislature that the state's technical infrastructure be consolidated under the central control of the OT. The goal of consolidation was to gain efficiencies by centralizing and standardizing the state's technology assets specifically intended to:

- Eliminate duplications of technology functions being performed within each department;
- Leverage the state's buying power to negotiate the best deals on technology contracts;
- Develop common standards to eliminate data sharing issues among departments; and
- Maximize the use of existing assets because many agencies grossly under utilize their hardware.

This mass consolidation project would also centralize IT-related staff positions across the executive branch into the OT, which would be solely responsible for:

- Setting technology standards;
- Managing technology-related contracts;
- Consolidating and centralizing underutilized hardware assets;
- Setting and enforcing technology security standards; and
- Providing project management services for executive branch departments.

By addressing these issues, the OT anticipated that the state would realize substantial reductions in operating costs; higher levels of security and reliability; and, in turn, greater levels of customer satisfaction.

Consolidation began in February 2007, when the Department of Health and Human Resources (DHHR) and the Department of Transportation (DOT) consolidated into the new OT organizational structure. As part of the consolidation process, the OT established memorandums of understanding (MOUs) and service level agreements (SLAs) with its customers to govern the relationship between the organizations. All other classified civil service agencies of the executive branch consolidated with the OT by May 2010. The OT provides over 40 fee-based technology services and products to its consolidated customers and other state agencies. A copy of the current service catalog, along with current pricing, can be found at http://www.technology.wv.gov/ProductsAndServices/Pages/RatesCatalog.aspx.

The OT is organized around the following functions, totaling more than 240 employees:

- **Client Services Delivery -** Provides technical support and assistance to other agencies. Services include the service desk, field support, customer relationship management, account management, health IT support, infrastructure applications, and the technology learning center.

- **Information Services** - Provides software development and support in addition to database administration services. Also provides technology management services for WVFIMS, the state's financial information management system.

- **Project Management Services** - Manages information technology projects, establishes standards and methodology for project management, and supports project management tools. Also provides consulting services as part of the CTO review process for the acquisition of technology products and services and supports the CTO in the development, issuance, and publication of IT policies and procedures.

- **IT Security (Office of Information Security and Controls)** - Includes the Security Operations Center (SOC), information security awareness training, and internal IT auditing services.

- **Telecommunications and Infrastructure Operations** - Manages the OT data center, servers and storage, network operations, and telephony services. Also provides systems and network engineering services.

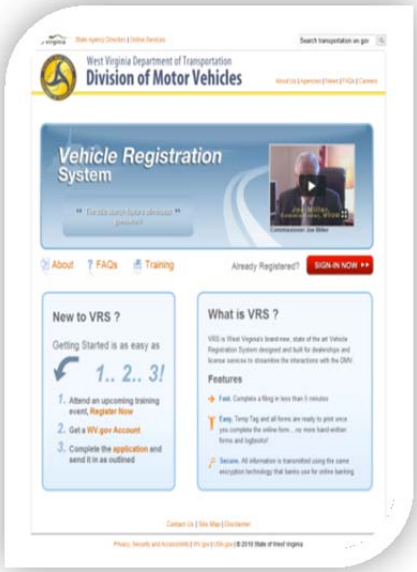
- **Administrative Services** – Provides accounting, asset management, contract management, IT purchasing, personnel management, technology billing, and time reporting functions.

1.6 National Recognitions

The OT receives 2011 NASCIO's Risk Management Award for the state's Cyber Security program.

Since the OT's initial recognition in 2009, the National Association of State Chief Information Officers (NASCIO) has recognized the State of West Virginia for numerous technology-related achievements. NASCIO's Recognition Awards honor IT achievements in the public sector by emphasizing IT initiatives that exemplify best practices, support the public policy goals of state leaders, assist government officials to innovatively execute their duties, and provide cost-effective services to citizens.

NASCIO selects the top three national initiatives within ten categories as Awards Finalists and honors one ultimate recipient per category as the top project from across the nation. In 2009, NASCIO recognized West Virginia in the "Enterprise IT Management" category for the state's IT consolidation program (for the complete 2009 nomination, see http://www.nascio.org/awards/nominations/2009/2009WV7-2009%20NASCIO%20Recognition%20Award%20Application%20-%20Consolidation.pdf).



The Division of Motor Vehicles received a Digital Government Achievement Award for its electronic vehicle registration system.

NASCIO recognized West Virginia twice in 2010. First, OT was recognized in the "Digital Government: Government to Business" category that honors innovative applications that improve interaction between government and business. Specifically, West Virginia's Division of Motor Vehicles (DMV) Electronic Skills Commercial Driver's Licensing Testing program received this innovative application honor.

Secondly, NASCIO recognized West Virginia in the category of "Risk Management Initiatives", which incorporates IT security and privacy as strategic state initiatives in addition to disaster recovery planning and continuity of government operations. This year, NASCIO recognized the OT's cyber security program in this category.

In 2010, the Center for Digital Government announced the West Virginia Vehicle Registration System as an award winner in the Government-to-Citizen State Government category. This annual competition recognizes excellence of official web portals of United States cities, counties, and states (for more information, see http://www.centerdigitalgov.com/survey/88/2010)

In 2010, West Virginia received national recognition when the Center for Digital Government recognized the state with two "Best of the Web" awards. First, the DMV Vehicle Registration System received a Digital Government Achievement Award, which honors agency and department websites and projects at the application and infrastructure level. Additionally, the West Virginia Higher Education Policy Commission received a Best of Web Award - Center for Digital Education, which showcases exceptional K-12 and higher education websites, digital technology projects, and programs that enrich education for students and teachers.

In 2011, NASCIO announced West Virginia Office of Technology Cyber Security Program as the winner of the NASCIO Recognition Award in the category "Risk Management Initiatives." This category includes IT security and privacy as strategic state initiatives, disaster recovery planning, and continuity of government operations. It includes initiatives for states to prepare and recover from major incidents including disasters, cyber-attacks, and pandemics. NASCIO also recognized the Statewide Local E-Government Implementation & Adoption program as a finalist in the Cross-Boundary Collaboration and Partnerships category. This category addresses identifying, planning, coordinating, sharing, integrating, or joining up formerly non-integrated IT-related organizational goals and strategies.

West Virginia continues to be recognized on a national level for its accomplishments in the information technology field.

In 1988, Computerworld, a leading source of technology news and information for IT influencers worldwide, began the Computerworld Honors Program. The program recognizes individuals, programs, and organizations for their "visionary applications of information technology promoting positive social, economic and educational change". In 2011, the OT was recognized by the Computerworld Honors Program for the statewide IT consolidation and efficiency initiative. (For more information see http://events.computerworld.com/ehome/index.php?eventid=16786&tabid=21121&categoryid=57262&)

On June 1, 2011, the Multi-State Information Sharing and Analysis Center (MS-ISAC) began its 3rd annual "Best of the Web" contest. This contest recognizes state and local governments that use their websites to promote cyber security. All 50 states and many local governments are judged on five main objectives: contact information, content, usability, accessibility, and appearance. In October 2011, MS-ISAC announced the OT's security website as the winner of the "Best of the Web" contest (for more information see: http://msisac.cisecurity.org/resources/toolkit/2011-best-of-the-web-contest.cfm).

1.7 Strategic Associations and Public-Private Partnerships

In the dynamic world of technology, it is imperative that open collaboration exists between the providers of technology and the constituents using technology. The OT is actively engaged with various multi-state and intrastate public/private partnerships. Specifically, the OT is actively engaged in the following partnerships:

1.7.1 National Association of State Chief Information Officers (NASCIO)

NASCIO's mission is to foster government excellence through quality business practices, information management, and technology policy by representing chief information officers, IT executives, and IT managers of the 50 states. CTO Kyle Schafer just completed a one-year term as President for NASCIO. He was voted into the position by his 49 peers from each state across the United States. Specifically, membership includes experienced, senior-level executives with statewide responsibility for IT leadership. More information can be found at NASCIO's official website: http://www.nascio.org.

1.7.2 National Association of State Technology Directors (NASTD)

Technology professionals across state governments comprise the National Association of State Technology Directors (NASTD), which promotes the effective use of IT services to improve state government operations. NASTD represents IT professionals from the 50 states and from the private sector. State members manage IT services and facilities for state government agencies and other public entities, including hospitals, prisons, and higher education. More information is available at http://www.nastd.org, NASTD's official website.

1.7.3 West Virginia Health Information Network (WVHIN)

The West Virginia Health Information Network (WVHIN) supports physicians and healthcare providers by promoting the best patient care through the electronic delivery of medical data. Established in 2006 by the legislature, and at the request of Governor Joe Manchin III, WVHIN promotes the design, implementation, operation, and maintenance of a fully interoperable statewide network to facilitate public and private use of healthcare information while ensuring the privacy and security of patient health care data. State CTO Kyle Schafer is a member of the WVHIN Board of Directors. More information regarding this public-private partnership that benefits all West Virginians can be found on WVHIN's official website: http://www.wvhin.org.

1.7.4 West Virginia Telehealth Alliance (WVTHA)

A non-profit organization dedicated to advancing telehealth and telemedicine capabilities, the West Virginia Telehealth Alliance (WVTHA) includes hospitals, rural health care centers, medical schools, doctors, mental health centers, local health departments, senior groups, consumers, the AFL-CIO, the West Virginia Chamber of Commerce, and major telecommunications companies. State CTO Kyle Schafer is a member of the WVTHA Board of Directors. WVTHA's official website is http://www.wvtelehealth.org.

1.7.5 West Virginia Broadband Council

The Broadband Council, created during the 2008 legislative session, provides consultation services to project sponsors in connection with the planning, acquisition, improvement, construction, or development of any broadband deployment project in West Virginia. State CTO Kyle Schafer represents the OT on the Broadband Council. More information on the Broadband Council is available through the West Virginia Department of Commerce (http://wvcomerce.org).

1.7.6 21st Century Jobs Cabinet of West Virginia

Created in September 2006 by an executive order signed by Governor Joe Manchin III, the 21st Century Jobs Cabinet promotes a seamless education system that connects every level of education from early childhood to graduate study and encompasses job training and lifelong learning. The 21stCentury Jobs Cabinet enhances and supports the state's job creation and economic development affairs. State CTO Kyle Schafer represents the Office of Technology on the 21st Century Jobs Cabinet.

1.7.7 West Virginia Interoperable Communications Council

The West Virginia Interoperable Communications Council leads the state's Interoperable Radio Project (IRP). The primary goal of the IRP is to continue the construction and complete the build-out of a statewide interoperable communications system. State CTO Kyle Schafer represents the Office of Technology on the West Virginia Interoperable Communications Council. For a more detailed discussion of the IRP, see Section 5.10, or visit the IRP's official website at http://www.wvirp.com.

1.7.8 Federal CTO Council

As President of NASCIO, Kyle Schafer represented the State of West Virginia and the other 49 states as a non-voting member of the Federal CTO Council.

1.8 NASCIO Top 10 Priorities of State CIO's

NASCIO promotes the exchange of information and the adoption of IT best practices and innovations to its member states. OT continually seeks to adopt best practices and gauges its performance against the national benchmarks of its peer organizations.

NASCIO annually surveys the 50 state chief technology and chief information officers to understand the top priorities of IT strategies, management processes, and solutions in state government. The top 10 priority strategies, management processes, and solutions for 2012 are the following:

1. **Consolidation / Optimization:** centralizing, consolidating services, operations, resources, infrastructure, data centers, communications and marketing "enterprise" thinking, identifying and dealing with barriers

2. **Budget and Cost Control:** managing budget reduction, strategies for savings, reducing or avoiding costs, dealing with inadequate funding and budget constraints

3. **Governance:** improving IT governance, data governance, partnering, inter-jurisdictional collaboration, industry advisory boards, legislative oversight - achieving proper balance, agencies participating as members of a "state enterprise"

4. **Health Care:** the Affordable Care Act, health information and insurance exchanges, health enterprise architecture, assessment, partnering, implementation, technology solutions, Medicaid Systems (planning, retiring, implementing, purchasing)

5. **Cloud Computing:** scalable and elastic IT-enabled capabilities provided "as a service" using internet technologies; governance, service management, service catalogs, platform, infrastructure, security, privacy, data ownership, vendor management, indemnification, service portfolio management

6. **Security:** risk assessment, governance, budget and resource requirements; security frameworks, data protection, training and awareness, insider threats, third party security practices as outsourcing increases; determining what constitutes "due care" or "reasonable"

7. **Broadband and connectivity:** strengthening statewide connectivity, public safety wireless network/interoperability, implementing Broadband Technology Opportunities Program (BTOP) grant

8. **Shared services:** business models, sharing resources, services, infrastructure, independent of organizational structure, service portfolio management, marketing and communications related to organizational transformation

9. **Portal:** maturing state portal, e-government, single view of the customer/citizen, emphasis on citizen interactive self-service, accessibility

10. **Mobile Services/Mobility:** devices, applications, workforce, security, policy issues, support, ownership, communications, wireless infrastructure

While the OT's strategic planning process is independent from NASCIO, the OT's strategic objectives do align with the national priorities identified by NASCIO's survey of all states. For more information on NASCIO's survey visit:
http://www.nascio.org/publications/documents/NASCIO_CIOPriorities2012.pdf

2 Client Services Delivery

Rob West
Acting Director of Client Services Delivery

The OT's Client Services Delivery section is responsible for the direct customer support of enterprise customer-facing technologies.

Relationship Managers serve customer agencies as a single point-of-contact for communications at the agency and cabinet levels. They understand the mission and goals of their customers and how infrastructure technology can best be used to advance these goals. They also inform customers on changes and service availability at the OT.

The Service Desk is the front line for the OT, as it receives, resolves, and distributes customer requests and problems. Acting as the OT's eyes and ears, the Service Desk knows about issues first, whether those issues are site outages or relatively simple procedural questions.

Desktop and Field Support staff act as statewide "boots on the ground" for issues that require a physical presence. They are experts on local office operations, infrastructure, and direct customer needs.

Infrastructure Application manages and provides training for executive branch email, messaging, the standard office suite, collaboration, voice and data conferencing, electronic fax, managed desktops, and account provisioning.

2.1 Consolidated IT Support

In May 2010, the OT completed consolidation through MOUs with all the major departments within the initial purview of the consolidation. As of September 2011, the OT supported 23,097 computers and 18,706 network users. The major challenge centered on providing the same or better level of service to the 75 unique agency environments comprised of nearly 20,000 employees at 1,075 locations geographically disbursed across the state. While initial attempts at managing and supporting this complex and distributed environment were daunting, the OT undertook several priority consolidation initiatives to reduce complexities, attain efficiencies, and reduce risk. The sections that follow highlight the OT's consolidated IT support efforts.

2.1.1 Managed Desktop Program and Green IT

The OT created a single managed desktop environment for all agency customers. Agencies procure hardware from a single manufacturer who applies the state's standard or custom images prior to shipment to customers. This desktop image provides a common set of productivity tools to all agency employees. To ensure agency customers have the greatest opportunity for success when using their technology tools, the OT makes available multiple avenues of training. Further, the OT manages software licensing to maximize the value of software investment. The single executive domain model, WV.gov, allows for the simplification of personal computer (PC) administration and a common email system. Advanced PC management tools allow for automation of configuration management, power management, software distribution, and inventory.

Benefits of establishing the managed desktop program include the following:

- The original 75 agency customers dispersed at 1,075 locations are now configured and serviced with a consistent desktop solution.

- The staff previously serving these multiple sites is able to learn new skills, support new tools and technology, and add business value to the agencies.

- The effective use of PC management tools streamlines the PC support process for patching equipment, managing inventory, and distributing software across the single domain.

- The PC management tools result in operating cost reduction and time efficiencies for the state employee workforce by allowing updates to occur after normal business hours.

- Focusing on Green IT, the power management system returns utility cost savings to the agencies. Prior to implementation, only 30% of the nearly 20,000 employees followed the OT's guidance to shut down their computers at the end of the workday. After implementation, 100% of idled computers on the system are shut down at the end of the workday. Automating the shutdown of PCs currently saves the state approximately $250,000 each year. Once fully deployed by mid-2012, the OT expects power savings of approximately $500,000 annually.

- Utilizing a single manufacturer for hardware acquisition creates efficiencies in a cost effective manner in addition to meeting configuration and Green IT standards.

OT' service desk employees are on the front-line successfully helping customers from around the state, resolving 65% of all incoming calls on initial contact.

- Each state employee utilizes a consistent set of productivity tools.

- State government acquires software at its best cost while tracking and managing licensing fees.

2.1.2 Consolidated Service Desk

OT's Service Desk was formed through consolidation of staff from several agencies. This consolidation provided the Service Desk with employees with knowledge and experience in supporting the legacy agencies. The OT developed a problem management system immediately prior to the initial consolidation. Through cross-training, industry certified training, and regular in-house training, all Service Desk staff provide support to all consolidated agencies for a variety of problems and questions. The Service Desk resolves approximately 65% of all incoming calls on initial contact, while the remaining 45% are referred to subject experts or third-party service providers who have the appropriate systems access, hardware, or expertise to resolve the issue. Through expanded access to systems and support channels, the Service Desk will continue to grow its initial call resolution capabilities.

In 2009, the OT Service Desk began supporting the Department of Administration's General Services Division dispatch desk. The OT developed a customized solution for this support initiative, which includes customer satisfaction surveys – a first for the General Services Division.

2.1.3 Customer Relationship Management

As IT consolidation progressed and IT subsequently began to transform, the level of activity between the OT and the agencies grew at a tremendous pace. Communication is often difficult under normal circumstances, but unprecedented growth and change can cause many opportunities for confusion and miscommunications. To ensure customers' needs were met, the OT formally established the role of Customer Relationship Manager in October 2008. Assigned to each department and agency, relationship managers serve as the customers' single point of contact. Relationship managers are the agencies' advocates within the OT and ensure that the agencies' technical requirements are met and prioritized within the OT. In addition to advocating, relationship managers provide agency feedback to the OT. To be successful in these roles, relationship managers maintain positive relationships and stay knowledgeable of each respective agency's political and business drivers. They provide agencies with technical updates and information on new products and services available through the OT or through technology-related contracts. In this role, relationship managers act as the business liaison for moving technology forward in each agency.

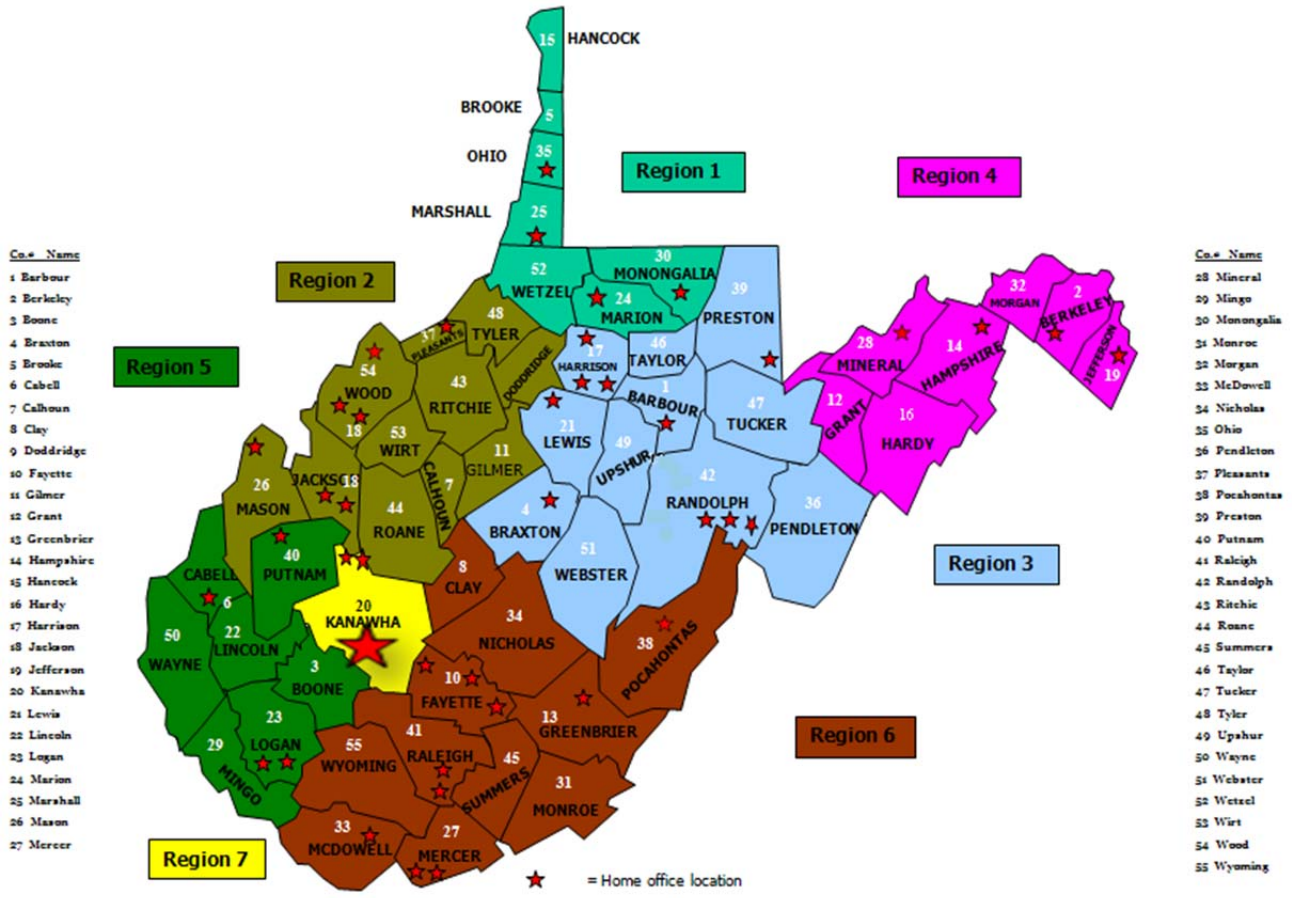
2.1.4 Regional Support

Through consolidation, the OT acquired field support employees from various agencies. Like the service desk staff, these employees came with specific knowledge of their legacy agency and its unique physical and technical environment. Through agency cross-training, the OT best practice

training, and industry certified training, these same employees are now able to support customers from any agency in a variety of environments.

For the purposes of on-site support, the OT divided West Virginia into seven regions, which is shown in Chart 2.1.4. Field support employees now service any agency in their county or geographic vicinity, resulting in an increase in productivity through reduced travel time, reduced travel expenses, and reduced wait times for customers.

Chart 2.1.4 (below) is OT's field support map. OT divided the state into seven regions. Field support employees build a rapport with and support state agencies in their region. This strategy reduced travel time and expenses for employees while reducing wait times for customers.



2.1.5 Centralized Email

The OT designed and implemented a central email system, the WV.gov Exchange, in 2007. Agencies are ported to the new system when they are migrated to the standard desktop. By September 2010, most of the consolidated state agency employees moved from a variety of disparate email systems to the central email environment. This resulted in a large reduction of legacy email and post office servers and allowed former email administrators to acquire new specialized skills. Currently, the email system is being transformed into a collaboration of

services including instant messaging, conference calling, and SharePoint services. The integration of these services provides users with a more efficient work environment.

2.1.6 Web, Video, and Voice Conferencing and Electronic Desktop Fax

The OT established services to provide a central web, voice, and video conferencing system and desktop electronic faxing. These services provide customers with interactive collaborative tools to complete projects, train, or generally communicate over distances all of which realize both time and cost savings for the agencies.

2.1.7 Directory Services and Centralized Provisioning

To increase efficiency and effectiveness, the OT established an enterprise directory service to be the underlying foundation for delivering infrastructure application services such as email and messaging, voice and data conferencing, and desktop faxing. In support of the enterprise directory, the OT established a central account provisioning unit to manage all account requests for organizations and employees for any additions, moves, and changes to the WV.gov network and shared directory resources.

2.1.8 Traditional, Web-based, and Virtual Classrooms

The OT Technology Learning Center (TLC) supports state employees' training needs by utilizing multiple learning platforms staffed with industry-certified professionals. Under the principle that employees are more productive if they know how to effectively use the tools available to them, the TLC offers both standard and customized courses for the suite of IT tools. The TLC emphasizes individual instruction to meet each employee's needs.

The TLC's multiple training platforms include the traditional classroom setting, self-paced e-learning, or the newly added virtual classroom. The TLC staff also develops and delivers training for agencies to meet their business specific needs.

The new OT Technology Learning Center in Building 7 on the Capitol campus is fully equipped to provide state employees with a multitude of opportunities to learn from OT's industry-certified professionals.

Type of Training	FY 2010 Sessions	FY 2010 Students	FY 2011 Sessions	FY 2011 Students
Classroom	97	1,512	207	3,665
Online	276	4,415	143	3,947
Total	**373**	**5,927**	**350**	**7,612**

OT understands that employees need the skills and abilities to fully utilize technology. Table 2.1.8: OT's Technology Learning Center Statistics for FY 2010 and FY 2011 (above) shows the number of training sessions conducted and students served by the TLC during the past two fiscal years.

2.1.9 Customer Satisfaction

Prior to consolidation, no agency consistently measured customer satisfaction of IT support among its employees. To improve customer support, in May 2007, the OT began surveying employees about their satisfaction level with the OT's services. Initially, the OT sent random surveys to 20% of customers generating call-tickets; this number increased to 40% after nine months. Since 2007, the annual number of call tickets increased from a little over 69,000 in FY 2008 to 111,884, by December 2011.

In addition to asking customers to comment concerning their experience with the Service Desk, customer satisfactions surveys include questions regarding the following areas:

- Ease of contacting the OT;
- Staff knowledge;
- Staff professionalism;
- Service timeliness; and
- Overall satisfaction level.

Since the OT began its customer satisfaction surveys, results indicate customers continue to be satisfied with the services provided. As a continuous learning organization, the OT reviews all survey results that are less than positive to determine if the OT can improve in certain areas or if the OT needs to better understand that customer's environment. After review, the OT acts quickly to increase the customer's satisfaction to expected levels.

In FY 2011, 91% of the customers were highly satisfied and 6% were somewhat satisfied, for an overall customer satisfaction rating of 97%.

	Strongly Agree	Agree Somewhat	Neutral	Disagree Somewhat	Strongly Disagree
FY 2008	85%	9%	3%	2%	1%
FY 2009	89%	7%	2%	1%	1%
FY 2010	90%	6%	2%	1%	1%
FY 2011	91%	6%	2%	1%	1%

OT prides itself on meeting and exceeding the high service levels expected by customers, while maintaining or reducing costs. The table above shows OT's Overall Customer Satisfaction Statistics and shows that customer satisfaction increased slightly each year.

OT continues to improve upon already high levels of customer satisfaction. Graph 2.1.9: OT Overall Customer Satisfaction FY 2008 – FY 2011 (above) shows visually the data presented in Table 2.1.9.

2.1.10 Industry Certified Employees

Working with the Division of Personnel and the State Personnel Board, the OT established new IT classifications for Service Desk and Regional Support staff. These new classifications require employees to acquire industry standard certifications in their area of specialization. Employees continue to take advantage of training opportunities the OT provides to acquire these certifications. As a result, now most employees hold at least one certification, with several earning two.

2.2 Strategic Goals

Client Services Delivery will build on its accomplishments by achieving the following strategic goals in the next three years.

2.2.1 Deploy Customer Portal

While WV.gov offers a wide variety of tools and services, customers do not always know where to find these tools and services when needed. To alleviate this issue, the OT created the MyITTools customer self-service portal to provide information on the tools and services

available. Currently, the OT is working on expanding the customer portal to include a variety of interactive online forms, information, and links to expand on the initial offering. Customers will be able to easily navigate to solutions and will be able to interact electronically with the OT through the portal.

2.2.2 Publish Client Computing Roadmap

Customer interest in client computing opportunities continues to grow. As opposed to cloud computing, client computing refers to processes that are performed on local client devices – distributed PCs and mobile computing devices. To outline future opportunities, the OT will produce a client computing roadmap that will provide direction and anticipated adoption timeframes for client computing technologies.

2.2.3 Continuously Evaluate Cloud Computing Opportunities

In contrast to client computing, cloud computing refers to internet-based computing where the "cloud" provides shared resources, software, and information to computers and other devices on-demand. The OT utilizes cloud computing for software services only after it determines risk to be at an acceptably low level and the services to be cost-effective. As the cloud market continues to grow with more hosting and software services offered, the OT will evaluate the feasibility of cloud computing and will implement it where practical.

2.2.4 Complete Email Migration, Domain Consolidation, and Managed Desktop Initiatives

The OT continues to work on its email migration, domain consolidation, and managed desktop initiatives, which are approximately 95% complete. The remaining 5% of agencies present unique challenges due to physical location, age, and condition of their legacy infrastructure or political barriers. The OT will continue to address these challenges and expects to complete these initiatives by the end of 2012.

2.2.5 Upgrade Email System to Exchange 2010

The OT will upgrade the current email system, which is a combination of Exchange 2003 and Exchange 2007, to Exchange 2010 by June 2012. The resulting solution will provide a mix between in-house and cloud-based email dependent on customer needs. The new system will allow the current email archiving system to be retired and the remote disaster recovery system to be implemented.

2.2.6 Deploy Rights Management Services

The OT will implement Microsoft Windows Rights Management Services (RMS) to provide customers with the ability to control how they use and distribute their digital content. Content authors will be able to allow or disallow specific operations such as printing, copying, editing, forwarding, and deleting for individual pieces of content. RMS will play an important role in preserving and controlling confidential and protected information.

2.2.7 Implement Enhanced Disaster Recovery for Critical Infrastructure Systems

With the construction of a secondary data center, critical infrastructure applications will now have a hot or cold site for disaster recovery. Email, active directory, antivirus, and other infrastructure applications will be available through the secondary data center disaster recovery implementation.

2.2.8 Implement Adoption Accelerator Program for Office Communications Server

One of the tools deployed as part of the standard desktop, Office Communications Server (OCS), provides instant messaging, presence, voice, and file transfer functions. Because the tool is somewhat misunderstood as some agency employees still fear the use of instant messaging by employees, the OT devised a program in January 2011 to encourage adoption of this tool that included education, awareness, and support. Currently, there are still ongoing education opportunities for agency employees.

2.2.9 Implement Adoption Accelerator Program for SharePoint Collaboration

Generally, state agencies utilize email to share documents and network file shares to store personal and shared information. Very few agencies utilize SharePoint, an alternative platform for enterprise content management, team collaboration, social software, and enterprise search. To encourage adoption of this platform that offers opportunities for increased efficiency and effectiveness, the OT will devise a program that incorporates awareness, training, and support.

2.2.10 Expand the Virtual Classroom

The OT offers virtual training delivered through its data conferencing systems and video. Currently, this training consists of shorter one or two hour courses, usually to orient customers to new products. The OT will begin delivering full courses, currently only offered in the traditional classroom setting, through its virtual classroom. This will allow customers throughout the state the opportunity to receive the same training as those in Charleston without the expense and loss of productive time due to travel.

2.2.11 Enhance or Replace the Service Management System

Developed at the OT's inception prior to the consolidation of agencies, the OT's service management system has served its purpose well during the consolidation process. Today, the system's age and capabilities do not provide the OT with the amount or types of information needed to manage the organization. The current system does not fully comply with the Information Technology Infrastructure Library (ITIL), which is the globally accepted best practices portfolio for full life cycle information services management. The OT will design a new system or redesign the existing system to include ITIL compliant tools and processes to enhance its organizational management.

2.2.12 Automate Provisioning

The OT oversaw the creation of the WV.gov network domain and migrated agencies' individual network domains into the WV.gov domain during the consolidation process. Prior to consolidation, 75 unique network domains, file structure philosophies, and account management practices existed. Each consolidation effort required the navigation and mapping of old systems and processes to the new network domain. Because of the large number of varying starting points, the OT faced many challenges trying to automate the provisioning process. As the WV.gov consolidation process nears completion, an automated provisioning process can now be designed and implemented. This automation will eliminate the highly labor intensive manual processes required by the account management team to provision an account and will provide for better documentation, tracking, and auditing of the provisioning process.

2.2.13 Implement a Customer Self-service Password Reset Portal

From September 2009 through August 2010, the OT's service desk received 20,000 requests to reset network passwords and 12,000 requests to reset mainframe passwords. As the size of the customer base of the WV.gov domain increases and the number of unique networks decreases, a self-service password reset system is now practical and cost justifiable. Although research shows that not all customers will use an automated self-service system, the OT expects the number of password-related calls to the service desk should decline by 40 to 60 percent with the implementation of this tool. A system has been acquired, installed, and piloted. The OT expects to complete deployment of this technology by the end of 2011.

2.2.14 Bring Your Own Device (BYOD) Initiative

The Bring Your Own Device (BYOD) initiative has been implemented to reduce the cost of purchasing devices for the OT's employees. Employees are allowed to bring in their personal devices, such as cell phones, laptops, IPads, etc., to use in substitute of a state-owned device. The OT must inspect and approve each device before it is connected to the network.

2.2.15 Virtual Desktop Infrastructure (VDI)

Virtual Desktop Infrastructure (VDI) is currently being explored as the next major initiative of the OT. VDI is a form of desktop virtualization where a desktop operating system is hosted within a virtual machine running on a server. VDI could potentially simplify the provisioning of new desktops, reduce downtime in the event of client hardware failure, lower the cost of deploying new applications, and provide desktop image-management capabilities. The OT has identified specific use cases and will continue to explore this option in detail. A definitive decision will not be made until more research is completed.

3 Information Services and Project Management Office

The OT's Information Services (IS) and Project Management Office (PMO) sections are maximizing opportunities for coordination, communication, and collaboration with our customers to align information technology efforts with customers' business goals and priorities.

3.1 The OT's Information Services Section

Sue Ann Lipinski
Acting Director of Information Services and the Project Management Office

The OT's Information Services section provides application acquisition, development and support to state agencies. These applications include the following line-of-business (LOB) and enterprise wide systems for agencies:

- The West Virginia Financial Information Management System (WVFIMS), which is the state's official accounting system.
- The Purchasing Division's Team Effort for Acquisitions Management (TEAM) system.
- The Personnel Information Management System (PIMS) that tracks salaried positions in state government.
- The Public Employees Insurance Agency's Benefits Administration System (PEIA BAS).
- The Human Resource Information Management System (HRIS), which is the Division of Personnel's system for human resource information.
- The WV-11 (Personnel Action Form) System, which most agencies use to update the HRIS and PIMS systems, the Division of Personnel's job vacancy system, and the associated workflow.

Information Services supports customers throughout the full system life cycle, including business analysis services to capture and document requirements, systems design services to determine the technical infrastructure, implementation services for the delivery of software products, and conversion services when retiring an old application or moving data and code to a newer technology environment.

3.2 IS AND PMO ACCOMPLISHMENTS AND GOALS

Accomplishments

- Delivered "Project Management – Time Well Spent", an introductory project management course for Supervisors and Managers as part of the Division of Personnel Organization and Human Resource Development 2011 Performance Imperative training program.
- In collaboration with the Infrastructure and Telecommunications Team, implemented an initial, scalable Microsoft Dynamics Anything Relationship Management Production Environment referred to as xRM.

- Deployed the Consulting Services and CTO review request notification process to customers.
- Hired a Quality Assurance Analyst to initiate a quality assurance function for all application and data driven projects.
- Three employees participated in a Microsoft Operation Foundations (MOF) course and earned an MOF certification.
- Implemented the Regional Jail Authority (RJA) Billing System using Microsoft Dynamic xRM.
- Worked with DHHR to automate the family planning services payment process.
- Developed and hosted a robust SharePoint Environment with data repositories, electronic forms, and sorting mechanisms to support the Division of Personnel PLANS Project.
- Processed 1099's for over 100 agencies in 2010. A total of 10,689 were produced, for a total value of $311,653,375.38.
- Received the West Virginia IT Summit's 2011 Best Application Serving an Agency's Business Needs.
- Recognized as a finalist in NASCIO's 2011 Recognition Awards in the Cross-Boundary Collaboration and Partnerships Category.
- Purchased and installed a web application scanning tool to detect application vulnerabilities and provided recommendations to correct those vulnerabilities.

Goals

- Transition into a maintenance-only mode for the legacy systems slated for replacement by the ERP initiative.
- Launch the web accessible tool for updating, maintaining, and accessing the Application Portfolio.
- Publish the Project Management Methodology and work towards consistent application of the methodology for all projects.
- Expand the xRM environment to support testing, development, training and production requirements.
- Provide training to optimize staff skill sets to meet customer demands and utilize modern technologies.
- Create and publish Project Dashboards to promote transparency and improve customer communications.
- Implement an Application and Project Management Quality Assurance program.
- Establish a re-hosting pilot to move applications from the traditional mainframe environment to a flexible, cost-effective platform.

3.3 Support the Statewide Enterprise Resource Planning (ERP) System and Implementation

The OT is providing support as the state begins to leverage the ERP system to gain operational efficiencies and seamless integration across administrative business functions by fundamentally transforming how the state manages its financial, human resources, procurement, and other administrative business processes.

The Legislature has given their approval by funding the project. The Auditor, Governor, and Treasurer have united to move the state forward with the implementation of the ERP by accepting the Governance Model and identifying state team leads. The OT is providing leadership for the technical team.

The Information Services team contributed to the ERP system requirements gathering process which produced over 11,000 requirements. These requirements were included in the ERP Request for Proposal (RFP), issued in January 2011. The Information Services Team continues to participate in the evaluation of the ERP responses.

An ERP system is a comprehensive suite of integrated modules that provides end-to-end support for statewide administrative functions such as budget development, financial management, procurement, asset management, human resources management, payroll administration, and project management. Benefits of an ERP system include:

- Consolidation of numerous aging and redundant administrative systems across state government into a single, integrated ERP environment;
- The standardization of time and leave capture and reporting across the state;
- The elimination of manual paper processes by automating workflows;
- More favorable vendor pricing through enhanced procurement practices;
- Increased efficiency in the delivery of state services;
- Enhanced reporting services that support both daily operations and strategic decision making; and
- Enhanced access controls to secure information.

3.4 Increase Accessibility to Services through e-Government

The OT's self-funded public-private engagement with West Virginia Interactive (WVI) to provide new and enhanced methods for constituents continues to provide consistent results. Since 2007, WVI has worked to modernize the state's web portal, assisting nearly 60 state and local government entities to provide more than 130 new online services and websites. Of those 130 new services and websites, 74 have been developed at absolutely no cost to the state or its constituents. A few notable websites and online services, which have been developed at no cost to the state include:

- Child Support Payment Notification (https://apps.wv.gov/dhhr/spi)
- Registered Nurses Online License Verification (https://apps.wv.gov/nursing/rnsearch)
- Public Accountant License Verification (https://apps.wv.gov/accountancy/licensure/LicenseVerification)
- Criminal Justice Services Statistical Analysis Center (http://www.djcs.wv.gov/SAC/Pages/interactivedata.aspx)
- Homeland Security Suspicious Activity Reporting Form (http://www.wv.gov/fusioncenter/Pages/SARs.aspx)
- Governor's Internship Program Online Application and Host Search System (http://www.wv.gov/gip)
- State Web Portal (http://www.wv.gov)
- State Education Portal (http://education.wv.gov)
- West Virginia State Stimulus Reporting Website (http://www.recovery.wv.gov)
- Child Support Employer Resource Center Website (http://www.dhhr.wv.gov/bcse/erc)

The statewide portal project is funded by assessing modest transaction fees on certain online portal services. The portal processes more than 500,000 e-Government transactions each year. Some of the services that help financially sustain the portal include:

- Electrician License Renewals (https://apps.wv.gov/rs/firemarshal/electricians/)
- Public Accountant License Renewals (http://www.boa.wv.gov/Pages/renew.aspx)
- Land Surveyor's License Renewals (https://apps.wv.gov/rs/bps/licenserenewal)
- Vehicle Registrations and Temporary Registration Permits (http://dmv.wv.gov/vrs)
- CHIP Premium Payments (https://apps.wv.gov/chip/ppps)
- Business Registrations and Annual Reports (http://www.business4wv.com)

West Virginia will enhance two-way communication between state government and citizens through interactive portals, mobile computing, and social media.

Going forward, the portal project looks to continue its consistent growth of online access to information and services. Currently, the portal team has more than 60 new online services in the development pipeline. Some of the services that will soon be available include:

- Online Unemployment Employer Contributions
- Online Employer Child Support Payments
- Temporary Trucking Permits
- State Police Sex Offender Registry
- Registered Nurse Online Licensure and Reinstatements

The portal also continues to identify and develop new and innovative services and technologies to ensure the West Virginia Portal stays up-to-date and continues to provide value to its users.

3.5 Engage Citizens through Social Media

The state currently pursues an organic, top-down approach to citizen engagement. Starting at the governor's office, state officials utilize technology to open dialogue with citizens in a manner that is easy and efficient. A majority of executive branch departments utilize Facebook and Twitter to reach out to citizens and businesses. The OT has policies to ensure that social media usage is adopted in a consistent and professional manner.

The OT and WVI continue to work together to increase the use of streaming media to open citizen dialogue. Streaming media has the potential to significantly enhance citizen engagement by increasing transparency and making citizens feel a part of the governing process.

Some examples of West Virginia Government entities utilizing social media include:

- Governor Earl Ray Tomblin (http://www.flickr.com/photos/governortomblin)
- Secretary of State Natalie Tennant (http://www.facebook.com/wvsos)
- State Portal (http://twitter.com/wvgov)
- Face to Face Care Management Program (https://www.peiaf2f.com)
- West Virginia Office of Technology (https://twitter.com/#!/WVOT_Tweets)

3.6 Modernize and Manage Applications

The OT is continuing to update and standardize applications to improve the delivery of technology services to the public and reduce the costs associated with these services. Instrumental in the success of application standardization and modernization is the compilation and maintenance of a current, accurate reflection of the application environment. During 2012, the OT will continue to enhance and refine the Application Portfolio by confirming and updating the application details presented in the current portfolio. To facilitate data capture and reporting of information, the OT is implementing a new approach to refining and deploying the Application Portfolio. This approach will simplify ongoing maintenance of the application portfolio information and provide enhanced reporting tools not currently available in the existing application.

The most recently updated application portfolio consists of approximately 625 distributed business applications that cost in excess of $40 million annually. Supported by more than 300 full-time state employees and 60 contract employees in 31 agencies, some of these applications have been in use more than 15 years and are growing technologically obsolete. Over the next four years, approximately 160 of these applications will be replaced by the ERP system. However, the state will still face significant support challenges with the remaining application and database environments.

The state is positioning to address these issues by modernizing and standardizing its approach for acquiring and delivering applications. The OT has drafted a high-level planning document to estimate the cost and effort required to modernize existing applications, as reported in the Application Portfolio. This planning document includes cost estimates for labor, hardware, and software, as well as training costs to enhance the skills and abilities of the existing state work

force. The estimates are based upon the information that we currently have collected via direct submission to the Application Portfolio and customer interviews, as well as data collected from industry research.

To help agencies modernize their applications and manage technology investments within the four-year planning period, the OT will:

- Continue to meet with agency Chief Information Officers (CIOs) to ratify the initial application standards;
- Establish and maintain life cycle strategies that include versioning and upgrading;
- Implement solutions that follow industry standard interfaces and access protocols for data and networks;
- Provide high quality and cost-effective services that enable agencies to achieve their missions;
- Collaborate with customers and business partners to produce cost-effective solutions;
- Working with the CIOs to establish agreed upon processes to maintain and enforce these standards moving forward; and
- Upon completion of the working sessions with the CIOs, present the final application modernization recommendations and report to the West Virginia Legislature.

To assist OT's customers in the delivery of critical applications and services during unexpected events or outages, the OT is undertaking a project to help customers develop and formalize business continuity and disaster recovery plans for their applications. Information Services has expanded the Application Portfolio include information that will facilitate BCP and DR planning. This information includes, but is not limited to application criticality, application security classification Business Recovery Point Objective (RPO), and Recovery Time Objective (RTO).

3.7 Continue to Enhance and Streamline Application Delivery Services

3.7.1 Public Defender Services (PDS) Automation

Information Services delivered a Line of Business (LOB) interface that automated payments and receipts for the Appointed Counsel Claims Tracking System (ACCTS) transactions of the Public Defender Services (PDS). The LOB system enhanced processes to help eliminate a large and increasing backlog of payments to vendors and other payees for FY 2010, including 43,000 invoices totaling $30 million in payments. Also, due to the implementation of the new automated system, PDS avoided $212,000 in interest penalties for FY 2010.

The completion of the LOB system paved the way for the next step for PDS automation--the creation of a web-accessible automatic billing system for court appointed attorneys and other service providers. Information Services and the PMO office, in collaboration with the staff at WVI, initiated a phased approach of three interdependent projects required for the success of the online billing system. WVI built the web portal, while the Information Services staff completed software, and server upgrades to ACCTS. The completion of the final step is the interface

between WVI portal and ACCTS and is set for release in 2012. Ultimately, this will reduce submission and processing time for attorneys, service providers, and PDS.

3.7.2 Regional Jail Billing System

The Regional Jail Authority (RJA) is statutorily required to house inmates and individuals awaiting trial for local, state, and federal jurisdictions. Over the years, the current system in place to track and bill the various jurisdictions had become antiquated and inefficient. In 2010-2011, working in partnership with Microsoft and Planet Technologies, the OT Information Services, Project Management, and Infrastructure and Telecommunications teams contributed to the delivery of this cohesive solution using Microsoft Customer Relationship Management. In addition, the OT developed over 20 reports to support billing operations and reporting requirements. Enhancements will be delivered during a future project (2012) to modernize the overall TAG system.

3.7.3 TAG Stabilization

Disparate offender management systems have created challenges across the Department of Corrections, Regional Jail Authority, and Juvenile Services, which have limited the ability to achieve and successfully administer targeted goals. During 2011, the OT's Information Services, Infrastructure and Telecommunications, and Project Management Office teams initiated a project to stabilize the business critical TAG application and relocate the physical hardware in a secure, 24/7 environment. Overall, this effort will reduce outages and downtime; provide a seamless integration between the inmate tracking and billing systems; and decrease annual maintenance fees. This project will continue through 2012.

3.8 Grow and Improve the Enterprise Project Management Office

The Enterprise Project Management Office (EPMO) exists to:

- Provide an approval process for major IT projects undertaken by state agencies;
- Institute IT project management standards and methodology for managing IT projects throughout the entire project life cycle, including initiating, planning, executing, monitoring, controlling, and closing;
- Establish leadership for departmental steering committees to ensure compliance with the statewide strategic plan and the management plans of the individual agencies; and
- Provide project management and project oversight to ensure IT projects are managed with the appropriate level of accountability and transparency.

Since September 2008, the EPMO has offered comprehensive project management services to state agencies by:

- Establishing the Portfolio, Program and Project Management Board (P^3MB) to advise agencies regarding risk, priorities, and complex project issues;
- Coordinating, in conjunction with the Real Estate Division, the technical aspects of office moves such as telephony, desktop computers, cabling, printers, fax machines, and

network connections; and

- Developing and delivering a project management methodology workshop to train agency project managers and project team members.

Building upon this foundation, EPMO will work towards achieving the following objectives:

3.8.1 Standards and Methodology

The OT and EPMO expect the project management process to mature through the full adoption of project management standards and methodology to direct the management of projects, ensure that project objectives are achieved, and enhance the overall accountability of resources applied to projects. Further, EPMO will build upon the established methodology and structured environment by assuming leadership responsibility in the development of essential project management skills, standards, and metrics.

3.8.2 Process Automation

EPMO will implement an automated tool to streamline requirements compilation and the RFP process. Automated project management tools will also support the collection and reporting of information that will enable customers to allocate resources, reduce costs, meet delivery dates, and ultimately make better decisions related to project investments.

3.8.3 Employee Training

EPMO will develop, deliver, and implement a training program for IT project management to educate administrators, project managers, and other employees throughout the executive branch about the standard framework for project communications, planning, execution, monitoring, and closing. This highlights EPMO's strategic commitment to ensure that all employees have a project management mentality in terms of completing projects that achieve objectives, on time, and within budget.

OT's PMO will establish project management standards and methodologies for the executive branch.

In May 2011, the EPMO, in cooperation with OHRD within the Division of Personnel, created and presented the first session of "Project Management – Time Well Spent". The 6-hour class offered participants an introduction to various tools to manage project issues, communications, and risks. Three additional sessions were presented in 2011.

3.8.4 Technology Acquisition Process

EPMO's Consulting Services function processes in excess of 500 requests for review annually. Additionally, Consulting Services provides professional technical writing services for approximately 70

Request for Proposal (RFP) and Request for Quotation (RFQ) initiatives annually. During the past year, a customer notification process was implemented. Also, an automated workflow and reporting process to track the progress of outstanding technology product and services requests was designed. During the first quarter of 2012, Consulting Services workflow and reporting processes will be deployed within the OT and for its customers. Plans are underway to expand the consulting function to include business analysis services to facilitate and expedite the technology acquisition process.

3.8.5 Project Management Transparency and Reporting

The EPMO will provide information on the effectiveness of IT programs through the use of project dashboards. The dashboards will support decisions regarding the investment and management of resources and provide transparency of information. The types of information to be tracked with this system include project budgets and schedules along with health and overall ratings of these projects. This data will also be presented visually through various aids, such as pie charts and bar graphs with each aid being dynamic and interactive allowing the user to gain custom granularity of the data they wish to see.

3.9 Secure Application Development

Information Services has initiated a quality assurance (QA) function to ensure application controls are built into the applications and remain with the applications as they mature. In addition to security, QA will also verify accuracy, completeness, performance, conformance to standards, and clarity of work products prior to delivery to customers. Controls that will fall within the scope of QA review will include, but are not limited to:

- Access control;
- Auditing and logging;
- Authentication;
- Code review;
- Compliance with application standards;
- Configuration review;
- Data encryption;
- Data validation;
- Database interfaces;
- Documentation;
- Error handling;
- Load testing;
- Session management; and
- Web application controls.

The QA function has acquired and installed a web application scanning tool to automate the testing process. The tool will be used to scan existing web applications, as well as new applications prior to being moved into production.

3.10 Formalize a Change Management Process

Change management ensures that consistent methods and procedures are used for handling all changes that will be introduced into the OT environment. Establishing guidelines helps to reduce security risks prior to change deployment.

The OT has chosen to model its process after the MOF to improve efficiency and control during the change management process. Sixteen of the OT employees recently attended a MOF workshop, and since then a working group has been established to contribute to the change management initiative.

Currently, a project plan is underway and a change classification model is being developed. The change classification model will determine the severity level of changes by considering factors such as the number of users impacted, potential downtime, and back-out procedure availability. In the coming year, the working group will continue to refine the change management requirements and finalize a formal document.

PROJECT SPOTLIGHT:

west virginia

Statewide Broadband Stimulus Initiative

The West Virginia Statewide Broadband Infrastructure Project extends broadband services across the state by leveraging existing infrastructure to build a middle mile network with Multiprotocol Label Switching (MPLS) over Microwave and Fiber technology. The proposed network will provide a backbone to community anchors, including schools, libraries, hospitals, public safety agencies, and jails. The project is made up of the following initiatives:

Fiber Build Out

The main objective is to improve broadband network access to consumers in under-served areas of the state while improving access to broadband service for public safety agencies. Additionally, the purpose is to stimulate the demand for economic growth and job creation.

Microwave Tower

The purpose of this initiative is to upgrade current microwave network to provide the backhaul for broadband data connectivity to anchor tenants; incorporate fiber segments to provide new infrastructure to extend middle mile deeper into rural areas of West Virginia; and to establish 12 new tower locations to allow for redundancy and provide for future growth opportunities.

Greenbank – WVU

This initiative will provide direct broadband network access between Greenbank Research Observatory and West Virginia University. This will increase bandwidth capacity for educational and Internet2 purposes.

Perry Rios and Cindy Smith of OT are providing Project Management services for the Broadband Initiative

The OT is assisting in the implementation of the fiber build out and the development of the IP network to be placed over the Microwave System.

The overall cost of this project will be approximately $159 million, with $126 million of the funding coming from American Recovery & Reinvestment Act (ARRA) funds and $33 million supported by the state.

A project plan detailing the fiber deployment to the 1,062 identified anchor tenants has been developed. The plan tracks the fiber deployment for each site and provides status updates for executive reports created.

Before any construction could begin, the state had to receive authorization from the National Telecommunications Information Administration (NTIA) based on Environmental Assessments (EA). An EA is required on any build where new poles and / or trenches are required in order to place new fiber or microwave towers.

At this point, the fiber build-out is 39% complete. The project is on schedule and within scope and budget.

According to the grant, the project is to be completed by February 2013.

PROJECT SPOTLIGHT:

west virginia

Health Statistics: STEVE & EVVE

STEVE – State and Territorial Exchange of Vital Events

EVVE – Electronic Verification of Vital Events

The DHHR Vital Registration Office (VRO) has the responsibility to collect and provide statistical data and legal certification for births, deaths, and marriages in the State of West Virginia. Together with The National Association for Public Health Statistics and Information Systems (NAPHSIS), the agency recently implemented two vital statistic system packages in the state that will provide for the electronic exchange and transfer of data to other federal and state agencies reducing costs and increasing uniformity among reporting entities.

STEVE – Allows for the electronic exchange of birth, death, fetal death, and induced abortion records to jurisdictions of usual residence and from the jurisdiction of occurrence. Until implementation, this information was provided and tracked manually. This system also allows electronic submission to the Center for Disease Control (CDC) and submission of this data to other governmental (federal, state, and local) entities. With this implementation, West Virginia joins 30 others states and territories that now have the ability to exchange this information, with more planning to join by the end of 2012.

EVVE

EVVE – Allows for the immediate electronic verification of vital record information for death and birth certificates as proof of age, proof of citizenship, identification for employment purposes, issue benefits or other documents, and to assist in determining eligibility for public programs or benefits.
Requests for verification and or confirmation can be matched against 250 million records in jurisdictions throughout the country.

The implementation of EVVE will also serve as an integral part as the state moves towards the implementation of REAL ID.

These systems were installed in May 2011 and are fully operational, providing an efficient way to exchange data with other states while reducing or eliminating paper and manual keying tasks and thus producing cost savings. These systems will facilitate the compilation of West Virginia statistics by reducing the time spent waiting for receipt of information from other states.

PROJECT SPOTLIGHT: PLANS AND JCQ

In 2009, the Division of Personnel (DOP) embarked on a new statewide classficiation and compensation project in collaboration with the Hay Group. The goal of this project was to ensure that the state's classification plan accurately organizes and describes the jobs in state government and that the compensation plan is internally fair and externally competitive.

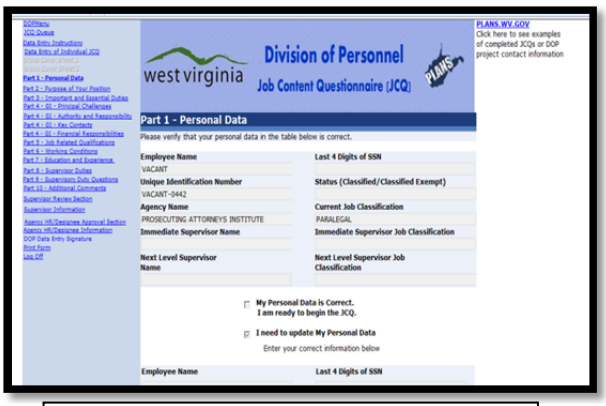
As part of this project, OT partnered with the DOP to develop a file repository and a web-accessible Job Content Questionnaire (JCQ) to be completed by all state government employees detailing information about their jobs. As of March, 2011, almost 17,000 JCQs were completed by state employees.

During the JCQ collection phase, the OT also established a call center to assist agency staff in accessing the JCQ site and provide triage assistance for the DOP.

The DOP is currently reviewing and sorting these questionnaires as part of their quality assurance phase. This phase involves reviewing each and every JCQ and sorting them according to like duties and responsibilities.

Pictured above are some of the project team members involved in the implementation of the JCQ PLANS project for the DOP. From top left Nancy Stark, Annie Anderson, Eric Dye, (front) Sunitha Mukkala and Alex Paz.

Once the JCQs are organized, the DOP will move into the "Evaluate Job Content" phase in which DOP will work with the Hay Group to complete the final reviews. These phases are expected to last until 2012.



Above is a screenshot of the web accessible JCQ.

This project touched all aspects of the OT and new tools and technologies were utilized and developed using SharePoint, InfoPath, and Active Directory Authentication.

PROJECT SPOTLIGHT:

Statewide E-Government Initiative

The Community Connect Foundation (CCF), with funding from the Benedum Foundation and the OT, and in partnership with the West Virginia Municipal League, West Virginia Association of Counties, West Virginia Department of Education, and West Virginia Interactive, has developed a Statewide E-Government Project. The primary goal of this project is to create a sustainable, informative, and professional website for every county and incorporated municipality in West Virginia to be housed on the State Portal (wv.gov). To accomplish this task, one high school was selected per county. The chosen high school was responsible for engaging their county and every incorporated municipality in their county to collect the necessary written and multimedia content that would be used to develop websites for political subdivisions that do not currently have an official web presence. CCF provided the selected high schools with a laptop computer, digital camera, digital camcorder, and all the necessary accessories that would be needed to collect the website content. The selected high schools will use this project-based learning experience as a means to learn about how county and municipality governments are organized and operated as well as provide a valuable service to their local communities. CCF's website is at http://www.communityconnectfoundation.org/

The Statewide E-Government Project had many goals and objectives, grouped under three categories: Community Outreach, Education, and Government Efficiency /Transparency.

Community Outreach:
Given the rural nature of West Virginia and the limited number of condensed population centers, it is necessary to nurture and embrace the autonomy of individual communities while introducing new concepts that seek to embrace commonality and uniformity on a statewide level. Through focused community building activities, the Statewide E-Government project has enabled communities to showcase their individuality through their websites while providing a foundation to bridge a technology gap that will inevitably lead to increased government efficiency and transparency. As the benefits of this program continue to be embraced, it is our hope that it will serve as a catalyst for increased adoption of technologies and as a demand driver for technology services that would otherwise be relegated to areas with high population centers. Increasing community strength and identity has been the key for this project and will continue to play an important role as communities look to build upon this project.

Education:
In preparing for the launch of this project, it was surprising to find so many students who were disengaged or ambivalent to their county and municipality government structure and function. The Statewide E-Government Project has served as a unique learning tool that engages the creativity, insight, and skillsets of students while providing a valuable service to their hometowns. Students involved with the project have not only increased their knowledge of how local government operates but have also been personally engaged with elected officials and government employees, as they sought to gather the information for the websites. This level of interaction has increased social, research, and analytical skills and has enabled students to apply their knowledge to a real-world application.

PROJECT SPOTLIGHT:

Statewide E-Government Initiative – Continued

Government Efficiency and Transparency:
With the decline in monetary resources for government operation and the increased calls for accountability, it is imperative that governments increase efficiency and transparency in order to be successful. The Statewide E-Government project has provided an opportunity for every county and incorporated municipality to accomplish the publishing phase of the PITA E-Government principle. By achieving this first step, local governments now have in place a framework in which to pursue interactive and transactive applications that can further increase government efficiency and transparency. As a result of this project and the continued project promotion pursued by CCF, local governments are starting to strategically pursue other technologies that may increase the efficient delivery of government information and services.

E-Government Overview:

E-Government is the use of information technologies in order to enhance the access to and the delivery of Government information and services to the public and to improve the effectiveness, efficiency and/or the quality of Government operations.

A simple E-Government system can be described in four steps (PITA): Publish, Interact, Transact, and Adoption. These four steps detail the basic progression of an E-Government system. The PITA principle is a condensed concept of basic E-Government principles that correlated well with the Statewide E-Government Project and in no way serves as a complete overview of E-Government in principle or in practice. For a more detailed analysis of E-Government, please check out the University of Minnesota's E-Government guide, *Access E-Government*, available at http://www.egov.umn.edu/

To date the Community Connect Foundation has received close to $500,000 for the development and implementation of this project. With the support of our partners and through the efforts of countless high school students across West Virginia, we have seen the successful publishing of every county website and are slated to publish every municipality website by the end of summer 2011. In addition to the success of this project a plan is in place to ensure the accuracy and sustainability of these websites once the project is completed. The WVOT has used this project as a tool to engage the youth of West Virginia to be active participants in their communities and local governments. It is our hope that this project will engrain the value of E-government services at every level of state and local government and we look forward to working with the WV State Legislature to ensure that it remains a priority.

PROJECT SPOTLIGHT:

WVOT Secondary Data Center Disaster Recovery Implementation

The OT is nearing completion of the infrastructure phase of the state's Secondary Data Center. The Secondary Data Center infrastructure costs have been funded by a stimulus grant with supplemental income provided by the state's Executive Branch agencies. The goal of the OT Secondary Data Center is to provide a framework for reconstructing vital operations that ensure the resumption of Recovery Time Objective (RTO) and Recovery Point Objective (RPO) for all business currently supported by the OT. This plan addressed duplicate emergency equipment acquisition such as servers, storage, uninterrupted power supply, cabling, as well as the re-direction of communications services to this alternate location. With the construction of the Secondary Data Center, critical infrastructure applications will now have a "hot" or "cold" site for disaster recovery. Email, active directory, antivirus, and other infrastructure applications will be available through the Secondary Data Center disaster recovery implementation.

WVOT's disaster recovery plan provides for the restoration of the most critical systems and services first based on the linkage between disaster recovery plans and business continuity plans.

4 Information Security

Jim Richards
Director of IT Security
Chief Information Security Officer

The OT understands the great importance of keeping entrusted information both secure and private. To reduce risk associated with the state's IT systems and data, the OT:

- Hired a chief information security officer (CISO) in 2005;
- Successfully recommended the passage of enabling legislation giving the CTO information security accountability across the executive branch; and
- Successfully recommended the signing of an executive order requiring mandatory security training for all executive branch employees.

The aforementioned legislation and executive order required the OT's new Office of Information Security and Control (OISC) to develop executive branch-wide policy, training, auditing, vulnerability assessments, risk mitigation assessments, and an intra-agency executive information security team.

While risk cannot be eliminated, it can be reduced through the adoption of best practices to safeguard all forms of information. These best practices include "layering" security, which involves the use of controls and protections at every opportunity – through administrative controls, technical controls, and physical security standards and compliance – within the information system landscape.

NASCIO awarded OT's cyber security program first prize in its "Risk Management Initiatives" category, which incorporates IT security and privacy as strategic state initiatives in addition to disaster recovery planning and continuity of government operations. OT's Office of Information Security and Control will build upon a solid foundation to reduce risk in a coordinated and effective manner by approaching it at the enterprise level.

The OT enables state government to reduce risk in a coordinated and effective manner by approaching information security at an enterprise level. This involves working closely with other state agencies, including the Governor's Executive Information Security Team (GEIST) and state privacy officers. GEIST, comprised of representatives appointed by the cabinet secretary from each executive branch department and chaired by the CISO, formed in 2007 to facilitate significant information security initiatives.

Each of the OT's information security objectives, where applicable, utilizes the International Standards Organization (ISO) and the National Institute of Standards and Technology (NIST) information security standards.

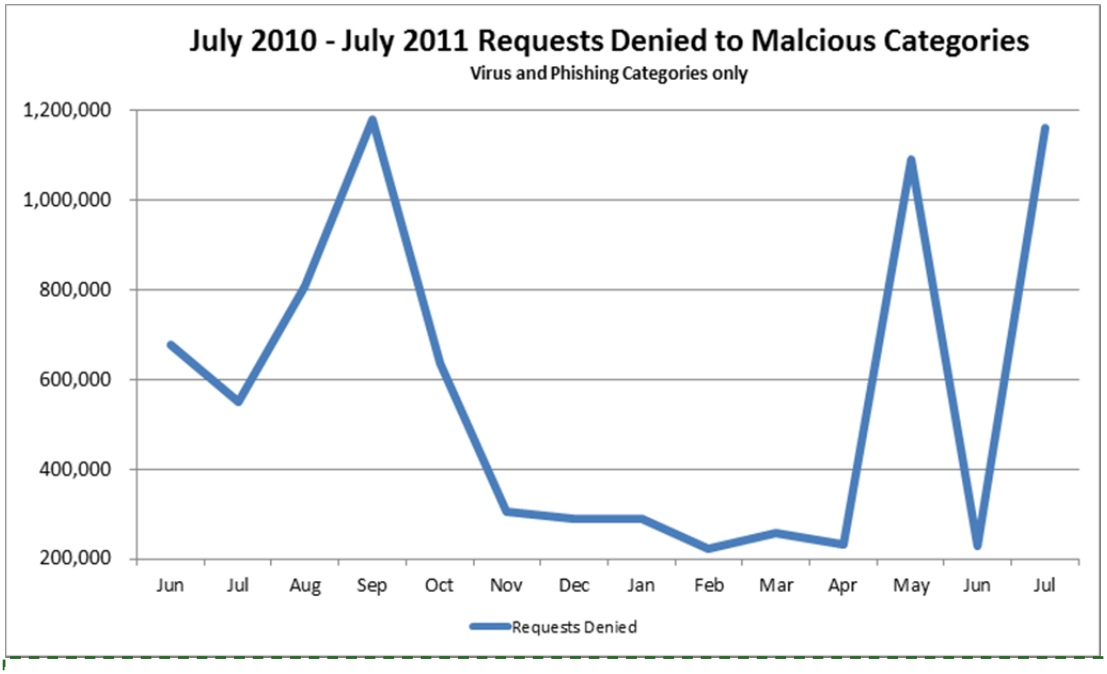
4.1 Refine and Develop Comprehensive Security Policies and Procedures

The OT issued the state's first comprehensive information security policy for the Executive Branch, which provides explicit guidance on acceptable and unacceptable uses of state-owned information systems, including email and Internet use. First issued in January 2007, the policy stresses employee accountability and addresses employees' expectations of privacy while using the state's information systems. The comprehensive information security policy continues to be updated regularly.

Moving forward, the OT will continue to further refine and develop a comprehensive set of information security policies and procedures applicable to all roles in the user and IT-support communities.

4.2 Strengthen the Privacy Partnership

Privacy and information security are independently critical functions that must be jointly and collaboratively addressed among state agencies. OISC works closely with the West Virginia Privacy Office to properly address privacy concerns related to technical and administrative security controls, and to provide privacy incident response. Policies and standards set forth by these offices must become integrated into all business processes within the executive branch.



FY 2011 Blocked Attempts of Known Malicious Sites (above) highlights the OT's Office of Information Security and Control's efforts to protect the state's network. The decrease between March and April is due to an improvement in process in which OT found that most of the connection attempts to known malicious websites correlate with having recently visiting a website that utilizes third- party advertisements, known as "ad rotators", which then referred connections to known malicious websites. OT blocked the sites utilizing "ad rotators" without any business impact to the enterprise. As a result of blocking access to such suspicious websites with "ad rotators", the system users are now no longer being redirected to the known malicious websites.

4.3 Institute a Vulnerability and Risk Management Program

Both internal and external risks are inherent in IT systems and data within enterprise environments. Risk management provides an understanding of what information technology components are of greatest value to the State and helps us direct resources towards protecting these components from potential and real threats resulting from vulnerabilities.

To determine the relative value of the state's IT components and data, GEIST and the OT are working with all state agencies to uniformly classify the state's data in terms of criticality and confidentiality. This is the first initiative of this type in the state's history.

In addition to instituting a vulnerability management program, the OT will continue to utilize the following multi-step, life-cycle approach to manage IT risks:

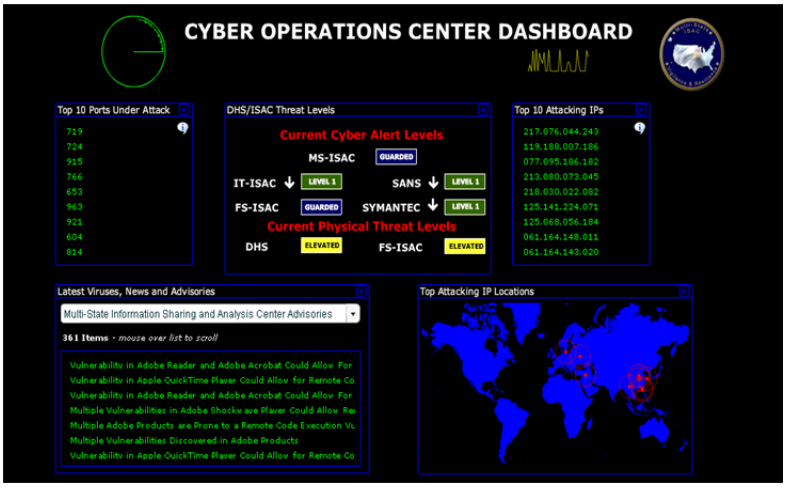
- Risk assessment;
- Risk mitigation; and
- Evaluation and re-examination.

4.4 Encourage Agencies to Engage in Business Continuity Planning

Each state agency must be responsible for the creation and maintenance of business continuity of operations (COOP) plans for its respective identified critical business functions. While the OT cannot be responsible for this part of the planning process, it must encourage all agencies to perform this process that is a prerequisite to the disaster planning process. The OT's disaster recovery plan is effective only when it is built upon the foundation of agency business continuity plans that identify critical systems and prioritize the order of system recoveries.

4.5 Engage in Disaster Recovery Planning

DR plans address the requirement for restoring adequate IT functions when a significant or protracted interruption in service occurs. These plans address emergency equipment acquisition and installation in addition to activating alternate locations for equipment, such as servers and storage, as well as the re-direction of communications services to alternate locations. Derived from business continuity plans, DR plans provide for the restoration of the most critical systems and services first. This linkage between DR plans and COOP plans ensures that restoration of IT functions is prioritized according to pre-defined business needs.



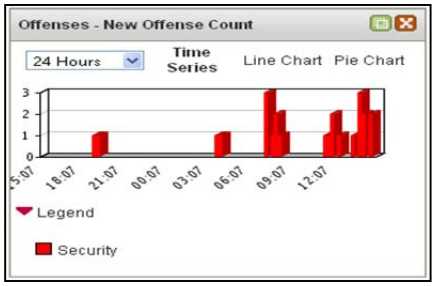
The OT's Security Operations Center utilizes dashboards (right) to monitor any threats that may affect the state's network, minimizing potential and real risks to state resources.

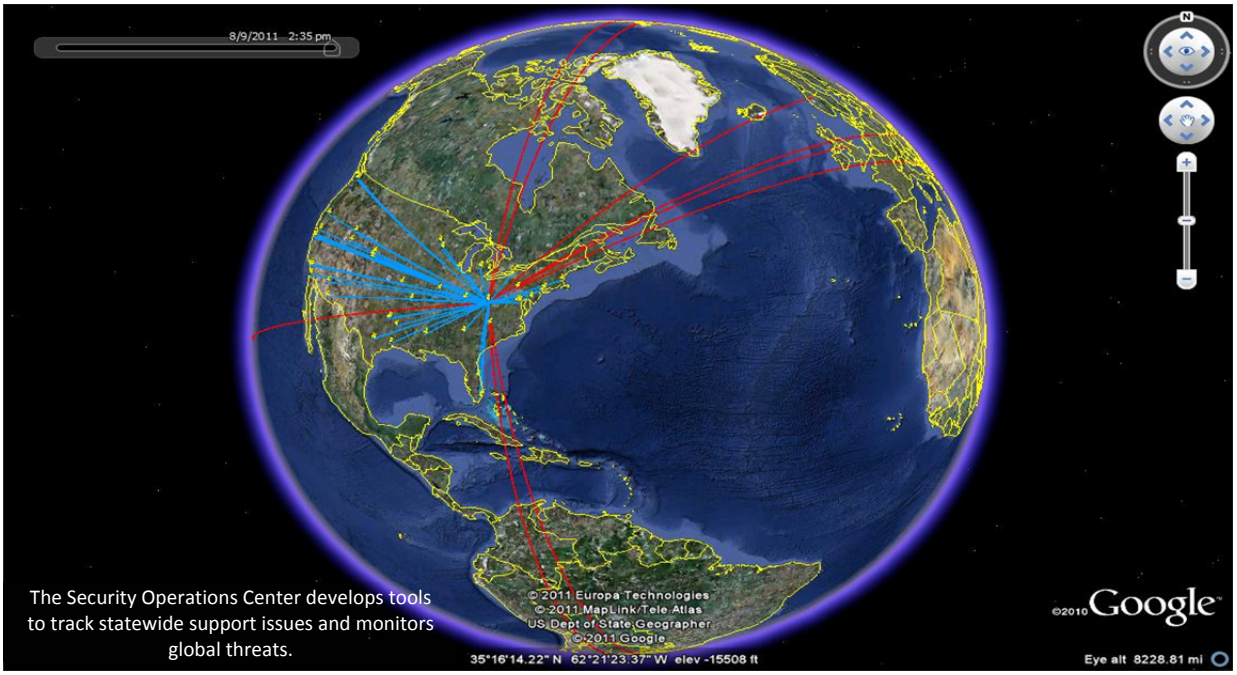
The OT is responsible for the recovery of IT functionality to meet the business needs of state agencies. While many of the OT's operational units play key roles in the development of a viable disaster recovery plan, the testing of the plan, and ultimately in the recovery of IT functions, it is the OT that must ensure such plans are completed, viable, and tested.

4.6 Increase Security Operations Center (SOC) Capabilities

The OT established the cyber security operations center (SOC) to continually monitor the security level of the state's dynamic computing environment. SOC monitors millions of events and traffic flows daily, correlating detected threats and intrusions to quickly respond to signs of virus outbreaks or other anomalies on the state's network.

OT's Security Operations Center protects the state network from worldwide risks. OT staff utilizes data arrayed in tables (below left, and charts (below right) to monitor network activity 24/7/365. These operations are crucial to protecting state assets in today's dynamic computing environment.





The Security Operations Center develops tools to track statewide support issues and monitors global threats.

Further, when needed, the SOC includes a highly trained computer forensics team to perform investigations. When necessary, the OT relays security bulletins to its partners such as local governments, emergency responders, law enforcement, and other public sector subscribers via the West Virginia Information Sharing and Analysis Center portal.

In addition to the aforementioned SOC activities, the OT's security initiatives reduce risks to the state's computing environment by:

- Scanning and remediating system vulnerabilities;
- Validating and updating security patch levels;
- Providing email and hard drive encryption capabilities;
- Maintaining an enterprise-wide web content filtering system;
- Utilizing an enterprise intrusion detection system; and
- Implementing an email SPAM filtering system separate from the WVNET system currently used.

Building upon this foundation of sound operations, the OT will:

- Enhance vulnerability scanning and threat management capability in the SOC;
- Establish network access control (NAC) mandates to prevent unauthorized or unsecure systems from connecting to the state's network and accessing state IT resources;
- Centralize and improve mobile device and wireless security controls; and
- Implement a more robust and secure authentication protocol.

4.7 Create a Culture of Security through Training

The positive effects of technological system security controls (such as firewalls, anti-virus programs, and email and hard drive encryption) diminish without an informed community of technology users. Users become cognizant of proper information security practices and procedures through training and continual reinforcement to create a culture of security awareness.

Using Learning Management System (LMS) technology, the OT deployed an executive branch-wide online International Standards Organization – ISO 17799 - based cyber security awareness training funded by the United States Department of Homeland Security. Required for all employees, this training is the first statewide deployment of this course provided by the Multi-State Information Sharing and Analysis Center in the United States. Approximately 88% of the executive branch employees who utilize OT-supported state resources have completed this training that focuses on social engineering, password management, physical security, acceptable use, workplace security, and Internet security. The OT has begun to release the next generation of standards based information security training developed by SANS Institute: Securing the Human.

Graph 4.7: FY 2011 Security Awareness Training (below) indicates the number of state employees who completed OT's online information security training.

4.8 Improve Internal Controls and Auditing Functions

The OT established an audit function to verify and validate compliance with IT and information security policies across the executive branch. Audit efforts focus on those areas of highest risk in addition to those areas where risk mitigation will provide the greatest potential benefit to the executive branch. This audit function will continue to be an integral component as the OT improves the executive branch's enterprise-wide controls through the establishment and documentation of controls, monitoring activities, and verifying compliance. Further, the OT will grow a visible controls framework that regularly impacts all state agencies and external business partners to mature into a critical and efficient control function.

In addition to establishing enterprise-wide controls, the OT will improve its internal controls using the same practices of establishment, documentation, monitoring, and verifying compliance.

The OT successfully completed an independently conducted "Statement on Auditing Standards 70" (SAS 70) audit. This audit verifies and validates the internal security controls that are in place to protect state systems and serves as a base audit that can satisfy the requirements of multiple audits conducted throughout the year. By completing the SAS 70 audit, the state saves time and resources as it avoids repeating future audits on the same control set. On November 9, 2011, an independent firm conducted and provided a satisfactory report using the newer rendition of the SAS 70, now Statement on Standards for Attestation Engagements No. 16 (SSAE16).

4.9 Apply Certification and Accreditation Principles to Implementation Initiatives

Certification is a comprehensive validation and verification of the viability of software or hardware that uses rigorous testing to ensure that security requirements are met prior to the software or hardware being introduced to the computer environment. Accreditation is the approval and authorization to initiate any change in the technology environment within the scope of certification and accreditation. Technology implementation processes need to apply certification and accreditation principles when applicable. To that end, the OT intends to develop a viable certification policy, procedure, and functionality for hardware and software implementation initiatives.

4.10 Enhance Incident Management and Computer Forensics Capabilities

As the frequency of reported incidents steadily increases, the OT must continue to proactively protect information and IT systems from disruption and be prepared to recover from the effects of critical information security incidents. This includes maintaining the established central point-of-contact for reporting incidents (incident@wv.gov) and offering consulting services and support during the analysis, recovery, and post-mortem phases of incident handling. The OISC has also developed and deployed an online incident reporting tool.

The Office of Information Security enables state employees to report issues conveniently and easily through the OT Online Computer Security and Privacy Incident Reporting System (left).

Computer forensics capabilities may be a part of incident management, as such capabilities assist in determining after-the-fact what transpired in systems at a user level, within a server or network component layer, or on a system-wide level.

5 Infrastructure and Telecommunications Operations

Network infrastructure encompasses the physical hardware used to interconnect computers and users including transmission media, servers, storage, voice/data circuit lines, routers, switches, wireless access points, and other devices that control transmission paths.

John Dunlap
Acting Director of Infrastructure and Telecommunications

The OT's Infrastructure Section consists of the following groups:

- **Data Center Operations:** Maintains the state's enterprise computer system, print shop, and mail room operations, which include disaster recovery, data storage, centralized and distributed server backups, enterprise server maintenance, and supporting data processing activities.

- **Cabling:** Provides dedicated communication lines connecting end-users, printers, faxes, telephony equipment, and most other equipment connected to the state network, which enables cost effective, secure, and reliable access to the available state electronic applications and communications services.

- **Network Engineering:** Provides the local/wide area infrastructure design necessary for users to access and transmit core data, voice, and video communications both internally and externally throughout the state.

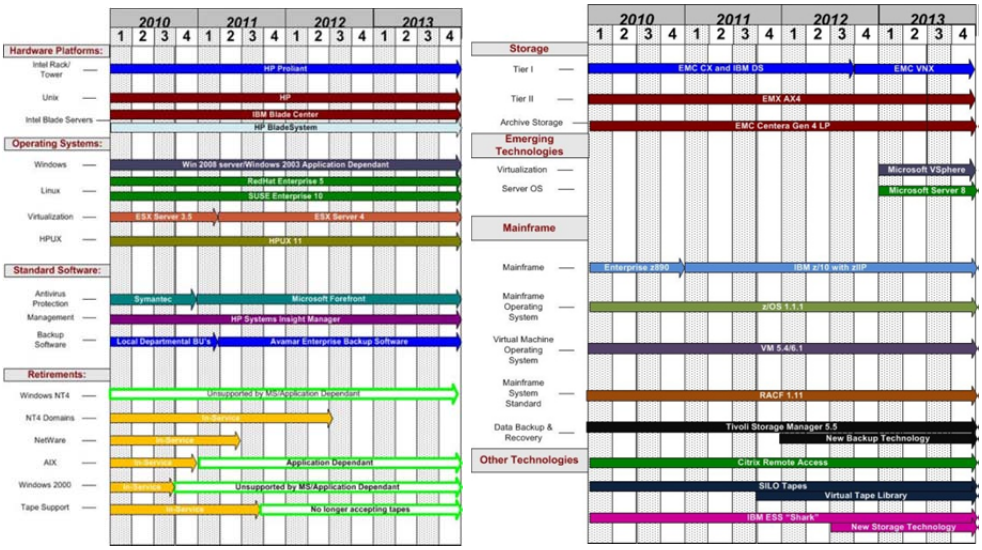
- **Telecommunications:** Supports internet protocol telephony (IPT) and traditional voice and call centers, which includes the equipment, network infrastructure, and services that enable employees to utilize voice communications throughout the state network.

- **Servers and Storage:** Operates the hardware and software for servers and storage, whether centralized or distributed, including shared network resources such as data storage, web servers, database servers, virtual servers, and shared physical servers for specific agency applications.

The following are the OT's Infrastructure Section's strategic goals.

5.1 Consolidate data centers and set up second backup site

The OT has consolidated 12 of the state's data centers located at agency facilities to a primary data center at Building 6 on the Capitol Campus and has set up a new second data center located in Flatwoods to serve as a DR site. Thus far, four agency data centers have been consolidated into Building 6.



OT's infrastructure consolidation efforts will reduce costs, improve service, and reduce risk. Chart 5.1: OT Platform and Operating System Migration Plan (right) is one detailed example of many of these initiatives.

This strategic initiative is borne out of the OT's role as an internal application service provider. The OT hosts applications at centralized facilities and coordinates the support, maintenance, upgrades, and administration of the software with the various application development groups throughout the executive branch. The OT has combined over 1,000 hardware, software, and networking devices as part of an overall server and storage consolidation initiative. This approach has resulted in superior performance, increased security, and enhanced 24/7 support at an overall lower operating cost. Chart 5.1 shows graphically the OT's platform and operating system migration plan for 2010-2013.

5.2 Consolidate Servers and Storage

The OT recognizes the inherent need to reduce the total number of servers to better control costs, reduce risks, conserve energy, and manage infrastructure. To that end, the OT will first consolidate servers to the aforementioned data centers, reduce the total number of servers, and then consolidate software applications that perform similar tasks.

The OT bases its server consolidation efforts on the annual age and conditioning cycle of current equipment. As servers need replaced, they are consolidated and centralized at that time. Although this approach requires minimal capital investment, overall server consolidation will take years to finalize because many of these assets have a four to six year usable life. This approach may be expedited if additional funding appropriations become available.

5.3 Establish a Network Operations Center (NOC)

To meet the ever-increasing challenges of maintaining a stable and reliable technology environment, the OT will establish a state-of-the-art network operations center (NOC) that will help avoid many service disruptions by providing around-the-clock proactive monitoring of the state's network and enterprise applications. The NOC provides the capability for effective service-based monitoring by clearly correlating services with the related technical infrastructure. Root cause analysis can then be conducted to prevent such an issue from reoccurring.

The NOC will proactively identify and resolve problems that lead to critical outages before such outages occur and, whenever possible, before any customer is aware that an issue has occurred. Because the NOC views the network environment from a service perspective rather than individual components, the staff will have an immediate view of what will be affected when a fault occurs and can take immediate action to prevent or minimize service disruptions.

Starting in November 2011, the NOC began implementation of the established alerting and monitoring tools required along with acquiring proper staffing levels needed to provide the around-the-clock proactive problem resolution service.

5.4 Establish a New Internet Service Provider (ISP)

Beginning in early 2012, the OT will seek to establish a new internet service provider (ISP) to offer internet connectivity for executive branch agencies. Because of the increasing business demand for internet presence, the state will require various service options such as firewall security, email filtering, and domain name services. This hybrid approach will allow the OT and the winning vendor to provide higher service levels to our customers at a reduced cost.

5.5 Support Broadband Deployment Initiatives

The OT works closely with the state's Broadband Deployment Council (BDC), an entity designed to facilitate innovative, quality, and affordable broadband internet service to all West Virginians. West Virginia received $126 million in federal government ARRA (stimulus) awards, as it is positioned to systematically and completely deploy broadband throughout the state. A main challenge in the state's broadband deployment is terrain, which leaves a major part of the state's households with limited or no access to broadband. Private providers do not extend coverage due to the cost of deployment and population scarcity, resulting in the most challenging demographic and topographic areas of the state remaining under-served.

West Virginia's broadband deployment strategy begins with the expedient, systematic, and sustainable build out of an open network middle mile solution that will provide fiber to critical community anchor tenants. This build out will allow local service providers to avoid costly fiber construction to remote locations within the state, making distribution of broadband to private, public, and residential areas financially feasible for the local carrier. This high quality middle mile solution is essential to the last mile completion of broadband deployment and should provide a full range of interconnect possibilities to meet provider, carrier, and end-user requirements.

Benefits of the stimulus broadband awards include the opportunity for redundancy, increased investment by private providers in response to the demand for enhanced services, and the deployment of current technology. The OT will play a major role in the daily operation, maintenance, and support of the deployment.

5.5.1 Health

DHHR envisions the efficient delivery of healthcare through the use of electronic health records. DHHR designed its portion of the middle mile to complement the federal initiative for electronic health records (EHR) and the WVHIN. The middle mile will provide access to over 25,000 providers

serving doctors' offices, healthcare facilities, hospitals, and individuals. Additionally, the bandwidth specifications and system deployment are designed to deliver healthcare to the West Virginians in greatest need of healthcare, as these individuals are also the least likely to have access to a hospital.

This broadband deployment enables progress towards goals and objectives outlined in the West Virginia Health Information Technology (HIT) statewide strategic plan (see http://www.wvhealthimprovement.org/wvhii/Attachment443.aspx). Developed by the West Virginia Health Improvement Institute under the Leadership of Martha Y. Walker, Interim Governor's Office of Health Enhancement and Lifestyle Planning (GO HELP), the HIT strategic plan aims to ensure that a coordinated information technology infrastructure and delivery system is established that allows patients, families, communities, and the health care system to collaboratively partner to improve the health and well-being of all West Virginians. In addition to being involved in the drafting of the HIT strategic plan, the OT will continue to support any initiatives required to meet the plan's goals and objectives.

5.5.2 Education

The state's broadband strategy systematically addresses the problem of the many remote schools not having bandwidth capabilities by bringing all schools to required levels.

West Virginia's public libraries complement the state's education initiatives. Through this broadband deployment, the majority of the state's libraries will be upgrade with adequate broadband capability to service the needs of local communities.

Although the OT works closely with both the Department of Education (DOE) and Higher Education, by statute these organization are responsible for developing technology strategic plans for their respective organizational units. The DOE plan can be located at http://wvde.state.wv.us/technology/techplan/documents/WVStateEducationalTechnologyPlanRevisedJan2009.pdf and the Higher Education plan can be located at http://www.wvnet.edu/files/pdf/wvnetstrategicplan2009.pdf.

5.5.3 Public Safety

The broadband deployment project will provide state police, county deputies, sheriff departments, police departments, and fire departments with broadband capabilities that would otherwise be unavailable. Additionally, all county courthouses will be served through this deployment.

5.6 Continue Implementation of a Statewide MPLS Network

To address current bandwidth limitations and to position the state for future needs, a new wide area network connecting all state facilities has been deployed. The OT engaged in a public-private partnership with Verizon to implement a multi-protocol label switching (MPLS) solution. This network allows an "any-to-any type" service connection, which supports all of the state's legacy protocols. This deployment provides a fully meshed network solution and will facilitate the OT's convergence of voice, video, and data networks. This MPLS solution has increased the state's overall communications capabilities, has reduced the state's telecommunications costs, and can be expanded to meet the state's future bandwidth needs.

5.7 Improve Voice Communications through Voice-over-IP (VoIP) Deployment

As part of the enterprise Cisco Call Manager cluster, the OT has deployed over 1,500 Voice-over-IP (VoIP) phones. The OT has also deployed Cisco's Contact Center which provides better call routing, call treatment, network-to-desktop computer telephony integration and multichannel contact management over an IP infrastructure. The following agencies are currently using this enterprise call center solution:

- DHHR;
- the Public Employees Insurance Agency;
- the Consolidated Public Retirement Board;
- the Division of Tourism;
- the Division of Motor Vehicles; and the
- West Virginia Poison Control Center.

Over the next 12 months, the OT will add an additional 2,500 VoIP stations by installing and migrating the Department of Transportation, Department of Environmental Protection, DHHR, and other state agencies.

In the last 12 months, the OT has deployed SIP Trunks to agencies in the Downtown Charleston area resulting in a decrease in monthly local service costs. These SIP trunks have replaced more expensive Centrex lines and ISDN circuits in that area.

5.8 Increase Wireless Networking Deployments

The OT deploys multiple wireless solutions in many state agencies for both public and private use, including internet access for the general public at the state capitol, state parks, libraries, rest stops, and at many of the state's tourist attractions. The state also deploys private wireless that supports remote and mobile state workers, including public safety access for interoperable emergency response and wireless options for any new state facility.

As security issues with wireless networks continue to diminish and wireless network bandwidth speeds continue to increase, wireless network deployments are expected to rise significantly throughout the planning period.

5.9 Improve Disaster Recovery Capabilities

The state recognizes the potential financial and operational losses associated with service disruptions and the importance of maintaining viable emergency response, resumption, recovery, and restoration strategies. It is imperative that many business functions and critical business information be available even during times of disaster or major disruption.

The OT has developed a secondary data center and is providing a framework for reconstructing vital operations at the Braxton County Technology Center located in Flatwoods to ensure the resumption of

time-sensitive operations and services in the event of such an emergency. Construction for the secondary data center was completed in September 2011.

The OT is currently working with the House of Delegates, Auditor's Office, and other state entities on installing DR services at the Flatwoods facility. Also, redundant telecommunications and data replication is currently being implemented for most Executive Branch agencies.

5.10 Support the Interoperable Radio Project

The Statewide Interoperable Radio Network (SIRN) is a collaborative effort by state, county, and municipal public safety entities to establish and maintain a state-wide interoperable radio network. Utilizing some of the latest technologies in the radio industry, the SIRN currently has over 72 sites operational, with over 13,000 users and provides coverage throughout much of West Virginia. The SIRN is in the process of completing the remainder of the build-out from current grant funding, which is to be a total of 107 sites by December 31, 2012. The SIRN's primary goal is to continue the construction and complete the build-out of a statewide interoperable communications network through:

- Promoting interoperability among public safety agencies;
- Providing more effective and efficient response for the public; and
- Helping to solve problems such as the overcrowding of channels, antiquated or unserviceable equipment, and federal mandates requiring narrow-banding of frequencies to conserve and better use radio spectrum.

By executive order, the Statewide Interoperability Coordinator (SWIC) provides recommendations to the West Virginia State Homeland Security Advisor, who in turn presents the information to the Governor to determine statewide priorities related to interoperable communications. The Statewide Interoperability Executive Committee (SIEC) provides day-to-day governing functions relating to communications interoperability for the SIRN. The CTO serves as an SIEC committee member.

More information regarding the SIRN is available at http://www.wvirp.com.

6 Administrative Services

The Administrative Services section supports the OT's other sections by accomplishing the organization's business functions such as accounting, asset management, contract management, purchasing, personnel management, technology billing, and time reporting functions. Administrative Services enables better business decisions to be made by providing relevant information. Decisions are made to support the strategic goals of maximizing the return on investment on IT spend and accurately accounting for the cost of services provided.

Bryan Hoffman
Chief Financial Officer

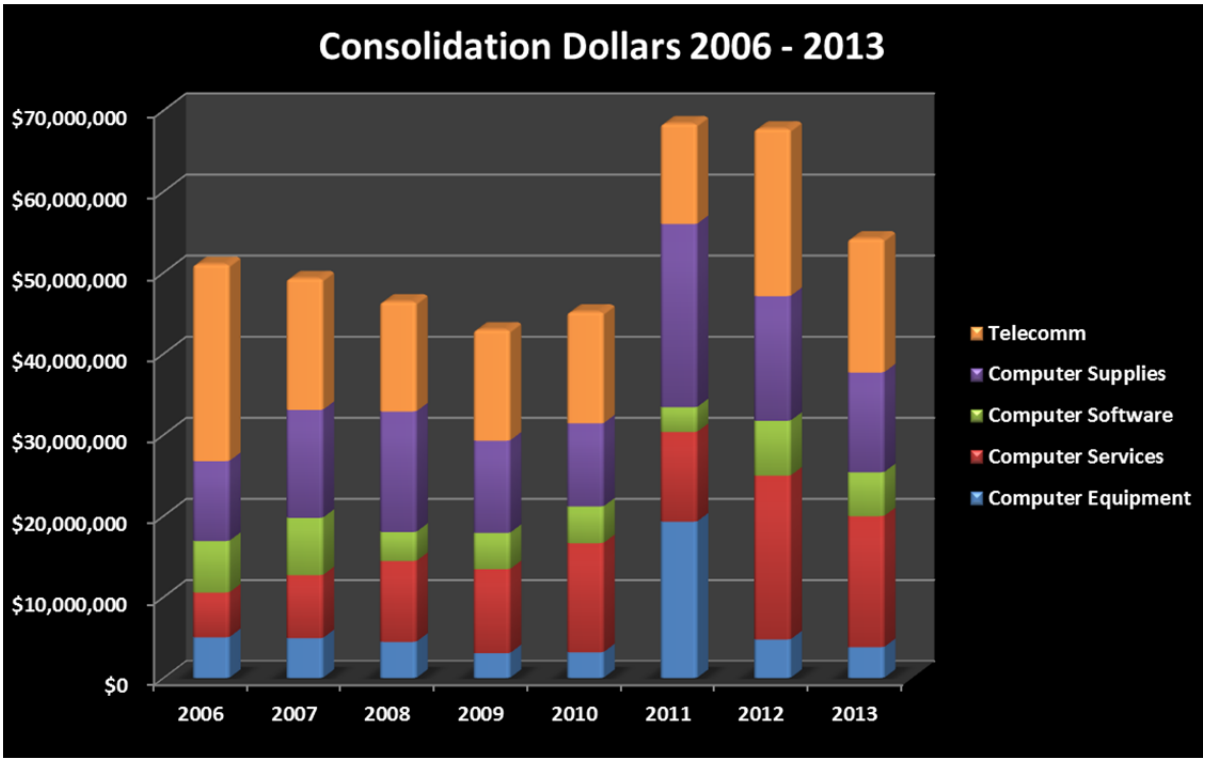
6.1 Maximize the Return on Investment of IT Spend

The results of IT consolidation efforts have been significant: IT-related costs have steadily declined, staffing levels have declined, and overall customer satisfaction levels continue to be high.

Most IT-related expenses are recorded in the OT's financial system under five different categories: computer equipment, computer services, computer software, computer supplies/equipment, and telecommunications. IT costs were in excess of $51 million in 2006. The first consolidation efforts in 2007 resulted in some immediate but insignificant reductions in IT-related expense. As consolidation efforts continued, IT related costs continued to decline. As a result, annual spend declined to $42.9 million in FY 2009. This represents an annual savings of $8.1 million, or a reduction in IT-related annual expense of approximately 10% since 2006. See Table 6.1 for more information.

The increase in costs for FY 2010 is associated with stimulus funding and other federal grants. In FY 2010, stimulus-related spend associated with IT initiatives exceeded $3 million. FY 2011 expenses were considerably higher directly related to stimulus spend. As stimulus programs continue, the OT expects high levels of IT investment to continue through 2012. HIT- and broadband-related stimulus initiatives will continue over the next 12 to 18 months. The OT estimates FY 2012 IT stimulus-related expense to be approximately $22 million. These federal funding programs are giving the state opportunities to deploy technologies that once seemed to be unaffordable.

Although the state has been extremely fortunate in the receipt of federal funds, in future years the state will be responsible for the on-going maintenance and support of these newly deployed IT assets. If the state does not take measures now to achieve even greater levels of efficiency by 2013, it will likely see a new annual baseline for IT expense in excess of 20% of today's annual total, as estimates for IT-related expenses exceed $54 million.



Spend Category/FY Spend ($)	2006	2007	2008	2009	2010	2011	2012	2013
Computer Equipment	5,022,420.82	4,912,046.65	4,459,375.67	3,052,205.45	3,165,589.98	5,223,223.47	4,748,384.97	3,798,707.98
Computer Services	5,523,691.55	7,770,873.96	9,966,406.19	10,361,467.92	13,469,997.40	22,225,495.71	20,204,996.10	16,163,996.88
Computer Software	6,351,707.46	7,071,439.00	3,579,217.99	4,468,835.78	4,508,475.87	7,438,985.19	6,762,713.81	5,410,171.04
Computer Supplies/Equipment	9,856,876.97	13,301,721.52	14,865,182.56	11,389,085.17	10,256,153.96	16,922,654.03	15,384,230.94	12,307,384.75
Telecommunications	24,274,911.15	16,217,191.77	13,535,979.65	13,683,652.35	13,749,828.27	22,687,216.65	20,624,742.40	16,499,793.92
Total	**51,029,607.95**	**49,275,279.9**	**46,408,170.06**	**42,955,246.67**	**45,150,045.48**	**74,499,586.04**	**67,727,080.22**	**54,182,067.58**

IT Spend Past, Present, and Future shows OT's consolidation initiatives resulted in savings, spend increases associated with the implementation of stimulus programs, and increased projected costs to maintain those programs in the future.

6.1.1 Staffing Levels

Staffing levels continue to be reduced through normal attrition as a result of consolidating and eliminating duplicative tasks previously performed by various employees across many state agencies. Table 6.1.1 shows that:

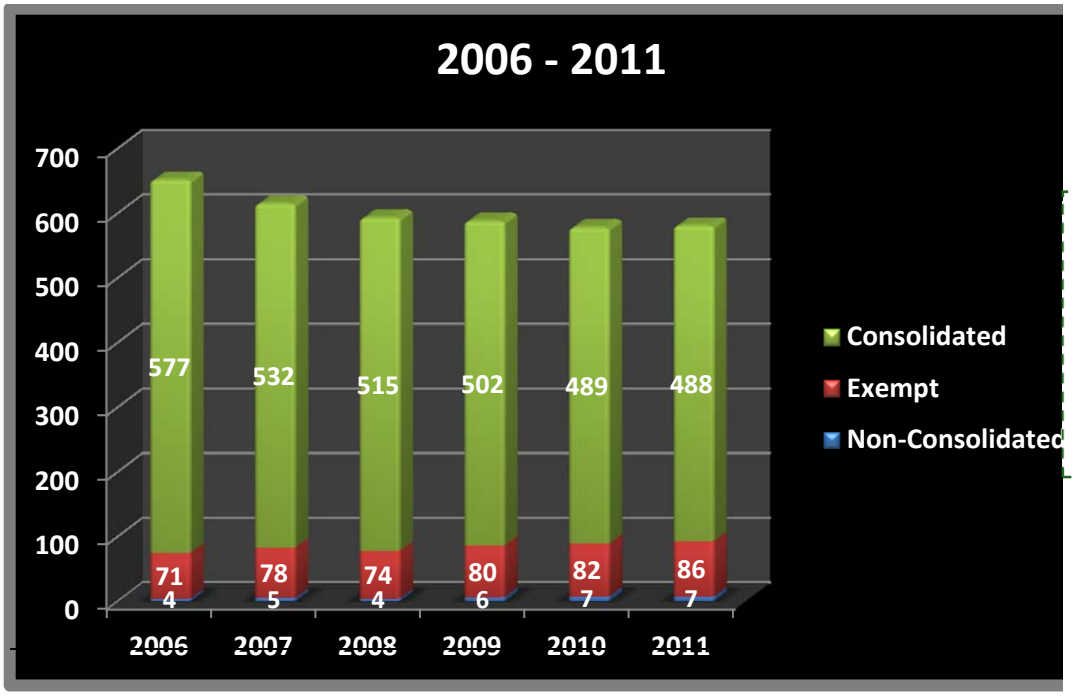
- Staffing levels of those agencies that are exempt from the OT remained the same from 2005 to 2010.
- A 25% increase in the staffing levels of those agencies that are not yet consolidated with the OT from 2005 through 2010. Note that staffing levels increased each year.
- A 12% decrease in the staffing levels of those agencies consolidated with the OT. Note that staffing levels decreased each year through normal attrition.

Through consolidation and eliminating duplicative functions amongst agencies, the OT is able to provide the same service level with fewer people. Since 2005, the number of full-time IT professionals in the executive branch decreased by 72, from 652 to 581 (note that during the same time, the number of IT professionals in consolidated agencies actually decreased by 82). The OT accomplished this through normal attrition. Considering the average salary of a state IT professional is approximately $43,160 and taking benefits into consideration, these staff reductions are saving the state approximately $4.1 million annually.

Agency/Year	2006	2007	2008	2009	2010	2011
Exempt	71	78	74	80	82	86
Non-consolidated	4	5	4	6	7	7
Consolidated	577	532	515	502	489	488
Total	**652**	**615**	**593**	**588**	**578**	**581**

IT Staffing Levels 2005 – 2010 illustrates that while other agencies maintained or increased staff, OT reduced staff through normal attrition.

The same information is arrayed in Graph 6.1.1, which shows that consolidated agencies are responsible for the state's reduction in IT personnel.



IT Staffing Levels 2006 – 2011 visually depicts the data in Table 6.1.1. The state's overall decrease in staffing levels can be attributed to OT's consolidation efforts. Staffing levels for exempt agencies increased from 2006 to 201.

Additionally, consolidation continues to open several opportunities for existing state employees. Since 2006, the average salary of an IT professional increased from $39,701 to $43,161, an increase of over 8%. During that same time, over 100 IT professionals received increases of more than 15%.

6.1.2 Statewide IT Contracts

Beginning in 2006, the OT began aggressively rebidding statewide IT contracts to obtain better volume pricing. Some examples of cost savings achieved through rebidding are:

- The first personal computer manufacturing statewide contract reduced the average cost of a standard desktop computer 47%, from approximately $950 to $500 per computer.
- The mobile phone statewide contract reduced average cellular charges by more than 19%.
- The renegotiated telecommunication data circuit contracts reduced the average cost per megabyte from $401 in 2005 to $259 in 2010. Additional negotiations associated with the Broadband initiative have further reduced the average cost per megabyte to approximately $60 in 2011.

6.1.3 Western States Contracting Alliance Agreements

In 2008, the OT gained approval to utilize multi-state IT contracts available through the Western States Contracting Alliance (WSCA). WSCA is a multi-state cooperative purchasing approach that enables states to achieve cost-effective and efficient acquisition of quality products and services. This provides another option to the state in the procurement of IT-related goods and services. Vendors responding to the state's IT-related needs must offer such goods and services at a lower cost than the WSCA contract if they expect to be competitive.

6.1.4 Enterprise Telecommunications Expense Management (TEM) System

Currently, telecommunication vendors bill the OT for services rendered for the executive branch. Moving forward, the OT intends to procure an enterprise telecommunications expense management (TEM) system. TEM systems utilize sourcing, inventory, cost allocation, invoice management, dispute management, and reporting and data analysis modules to manage telecommunications expenses.

6.2 Accurately Account for the Cost of Services Provided

Financed through the establishment of an intra-governmental service fund (or "revolving fund"), the OT must recover the cost of operations by billing its user agencies. While the legislature appropriates monies to a special revenue account each year, such an appropriation acts as an upper-limit spending authorization for the OT. Fund expenditures are completely dependent on the cash balance in the account, which means each revenue center within the organization must be self-sufficient. For FY 2012, the OT expects its total cost of core products and services provided to be approximately $35,000,000.

After a detailed review of the OT rate structure in 2007, management decided to revamp its rate model to ensure (1) the OT adequately recovered the costs of new products and services and (2) cost allocations aligned with the federal government's allocation requirements (see Section 6.2.3). The OT introduced this new rate model in FY 2009 and updates it annually to reflect modifications in the organization's service offerings. To better communicate and educate customers on the new model, the OT introduced its service catalog in FY 2009.

6.2.1 Service Rates Catalog

The OT publishes a service rates catalog annually to explain the technology products, services, and related rates for the products and services it provides. Designed as an easy-to-understand resource for customers, the catalog defines all the OT services in a concise format centered around the following three questions:

1. What is included in the service?
2. How will the OT charge for the service?
3. How can the customer better manage cost and consumption of the service?

Each rate structure is reviewed periodically throughout each year to compare revenues with the actual cost of the products and services. Recent updates include the streamlining of rates to better reflect services actually rendered and the cost of providing those services, so the OT can more accurately associate its expenses with the actual costs of the services provided.

A copy of the OT's current service rates catalog is available at:
http://www.technology.wv.gov/ProductsAndServices/Pages/RatesCatalog.aspx.

6.2.2 Shared Services Billing Methodology

Consolidating infrastructure support across the executive branch created a need for the OT to implement a shared services billing methodology. Shared services are those common services provided by the OT to all executive branch agencies, such as electronic communication, networking, personal computing support, telephony support, security services, user account management, and project management services. These are core, non-optional services that all the OT customers use.

Since the OT began using this billing methodology in 2009, its cost recovery model is based upon units deployed by the agency rather than utilization by the agency. The OT determines the cost to provide these services across the entire group and determines the rate to charge per unit by dividing the total cost by the total number of units being supported. This allocates the cost to be recovered more equitably and creates a more efficient support model for the end-user.

Services that are not utilized by all agencies continue to be billed based upon each agency's specific utilization.

It is important to note that since the shift to this methodology, some agencies' total cost of products and services increased despite a decrease in the state's overall information technology cost. This is a result of a better alignment between the products and services used by the agencies and the charges for that use.

6.2.3 Office of Management and Budget (OMB) Circular A-87 Compliance

The OT must comply with the federal government's Office of Management and Budget (OMB) Circular A-87, which establishes principles and standards for the determination of costs for federal awards carried out through grants, cost reimbursement contracts, and other agreements. It is imperative that the OT's rate structure reflects the true cost of providing each service and those federal funds are never used to subsidize other services. By comparing actual costs with revenues received for each service provided, the OT ensures greater compliance with this OMB directive.

7 CTO's Vision

Many opportunities are available for the state to leverage modern day technology at even greater levels to reduce cost, improve customer satisfaction, increase reliability, reduce security risk, and enhance services to the citizens of this great state. By working together, the state has made significant accomplishments and tremendous progress regarding technology during this administration. The state must continue to build upon this foundation of sound IT management.

The pace of technological change will not slow down. Constituents' demands for better, faster, and more reliable ways to conduct business with the state will not diminish. The state's traditional ways of conducting business will not meet the needs of the next generation of West Virginians. By exploiting the technologies available, the state can begin to overcome tomorrow's challenges today.

The chart on the next page depicts the state's technological past, present, and future. By continuing to work together to meet the objectives of this strategic plan, the state can make tomorrow's vision a reality.

West Virginia's IT Past, Present, and Future

Yesterday	Today	Tomorrow
130 individual email systems	Central wv.gov email for 17,000 employees, limited disaster recovery capabilities	Single wv.gov email system, full fail-over to state disaster recovery site
Disparate desktop computer environment	Standardized desktop environment, full mobility and virtual networking	Virtual desktop infrastructure and fully managed desktops
Over 20 different authentication mechanisms	Central network for authentication with standard, authorized documentation	Single consolidated network and automated network and desktop provisioning
No messaging or collaboration tools	Messaging, collaboration, and voice and data conferencing	Fully integrated telephones, messaging, collaboration, and voice and video conferencing
No strategic plan for application development	Application portfolio defines current environment	Streamline and standardize applications to drive business value
Legacy approaches to development, traditional programming	Integration and combination of traditional approaches with new tools	Agile approach to application development, delivery, and enhancements
Various disjointed project management methodologies and approaches	Project Management Office and project management methodology	Institutionalized industry-recognized mature project management methodology
No coordinated IT audit function or internal control structure	Successful SAS No. 70 assessment of internal controls	Adopted internal control framework including risk management
Disparate website vendors and platforms, no centralized web publishing standards	Unified web content management platform	Centralized web standards program with government-to-citizen and government-to-business e-government services
Limited e-government services and abilities, unmaintained and underutilized web portal with no mobile or social networking presence	~100 e-government services with growing capacity, actively managed web portal with integrated mobile, social networking and Web 2.0 capabilities	Integrated e-government services that drive cost savings and process efficiencies, enhanced mobile and social content delivery platform
Disparate computer networks	Multiple Protocol Label Switching (MPLS) network	Next generation converged computer network
No disaster recovery facilities	Secondary data center established and ready for occupancy	Real-time data replication between two secure data centers
Distributed and uneven information security programs	Executive branch-wide information security program	Improved information security tools, skills, awareness, and uniformity